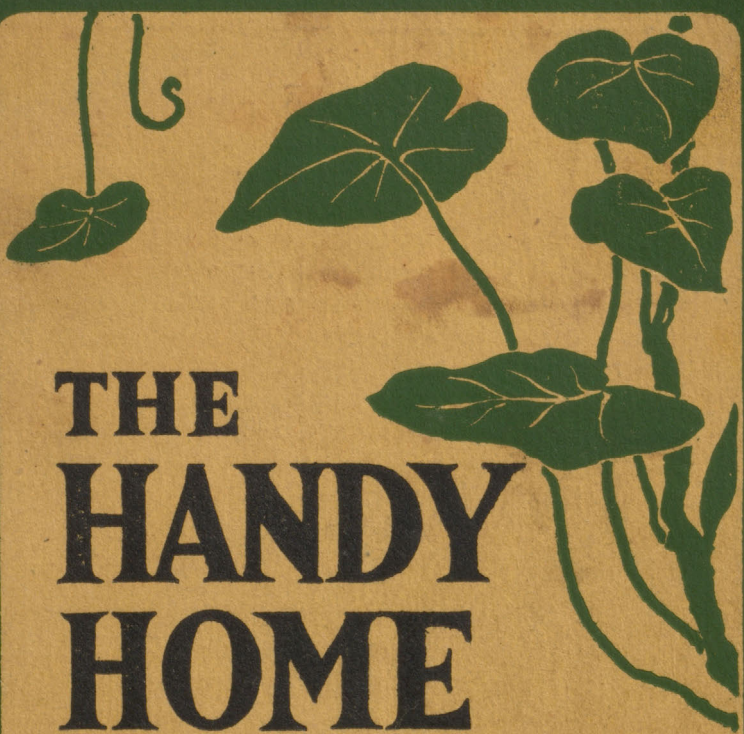

THE HANDY HOME BOOK

PUBLISHED BY
THE FAMILY HERALD
AND WEEKLY STAR
MONTREAL. CANADA.

ALL the information printed in this useful home book has been gathered from the columns of the "Family Herald and Weekly Star of Montreal" during the past two years. It represents only about one twentieth part of the questions and answers and general information that has appeared. Readers of the "Family Herald and Weekly Star" have the privilege of asking for information on any subject they desire, whether household, agricultural, medical, legal, historical, etc., etc. All requests are promptly replied to and this feature alone makes the "Family Herald" simply invaluable to its readers.

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THE HANDY HOME BOOK

AN ENCYCLOPEDIA OF USEFUL INFORMATION COMPILED FROM THE COLUMNS OF THE FAMILY HERALD AND WEEKLY STAR, MONTREAL, CANADA.

WHAT'S WHAT.

The Royal Arms.

The royal escutcheon of Great Britain and Ireland assumed its present arrangement at the accession of Queen Victoria. The supporters of the shield borne in early times by the kings of England varied much. James I. for the first time clearly defined the royal supporters, adopting the lion of England and the unicorn of Scotland as they have ever since been borne. The royal arms, described without the use of the technical terms of heraldry, consist of the quartered shield, the first and fourth quarters containing the three lions (or leopards) of England; the second quarter, the lion rampant of Scotland; and the third quarter, the harp of Ireland, the whole shield being surrounded by the garter. Above is the crest, consisting of the royal helmet upon which rests the imperial crown surmounted by a crowned lion. The supporters are the lion on the right and the unicorn on the left. Below the shield is the motto, "Dieu et mon Droit," with the union rose, shamrock and thistle engrafted on one stem.

Dominion Coat-of-Arms.

It is popularly supposed that the coat-of-arms of the Dominion consists of the arms, joined as quarterings, of all the provinces which form Confederation. This idea has, to a certain extent, been confirmed by the semi-official endorsement given in many Government publications, but it is none the less erroneous, for the quarterings are confined to the original four provinces, Nova Scotia, New Brunswick, Quebec and Ontario, which, on July 1, 1867, were united by the British North American Act into the Dominion of Canada. Therefore, a correct coat-of-arms contains the arms of only these four provinces. In the upper left-hand corner, or quarter of the shield, are the arms of Ontario, which consist of a sprig of three leaves of maple on a green background, and above them the red cross of St. George on a silver background. In the other upper quarter are the arms of Quebec, consisting of the fleur de lis, the lion "passant guardant" on a gold background, and below the lion a sprig of three maple leaves. In the lower left quarter, and below the arms of Ontario, are the arms of Nova Scotia, consisting of two thistles on a blue background, below this a salmon with silver background, and below the salmon one thistle on a blue background. In the other lower corner, and below the arms of Quebec, are the arms of New Brunswick, consisting of an ancient galley, with oars in action and sail spread, and above the

ship a lion. The coat-of-arms commonly seen bears, in addition to these, the arms of the three provinces that have entered Confederation since 1867; namely, Prince Edward Island, British Columbia and Manitoba. The arms of Prince Edward Island consist of a shield bearing three trees, the one at the right being much larger than the other two. The arms of British Columbia consist of a shield bearing a crown, surmounted by a lion, with the letters, B.C., on each side, and around the crown are two sprigs, one of laurel and one of oak, with stems meeting beneath the crown. The arms of Manitoba consist of a shield surmounted by a crown. The upper part of the shield contains a St. George's cross and a small crown, and below the cross is a buffalo.

The Union Jack.

The Union Jack is a combination of the separate national flags of the three kingdoms of Great Britain and Ireland, or at least of what have been accounted such. The red cross on a white field was, before the beginnings of heraldry, the distinguishing flag of England, and the white saltire on a blue field (the St. Andrew's cross) similarly the flag of Scotland. The first union flag, introduced in 1606, three years after the union of the crowns of England and Scotland, blended the two national flags by placing the cross of St. George over the saltire of St. Andrew, retaining the blue field of the latter: and giving the former a narrow white border or "fimbriation" to represent its white or silver field, and avoid the heraldic solecisms of colour on colour. At the union of 1707 the use of the first union flag was confirmed. In consequence of the union of 1801 the flag just described had to give place to one in which Ireland would be represented, and in which the red saltire on a white ground, which had since 1783 contracted an association with St. Patrick, should be introduced. In the new flag the St. George's cross with its fimbriation remained as it was, and the saltires of Scotland and Ireland were placed side by side with the white and red alternatively uppermost, and the fimbria of white separating the red from the blue field.

First Atlantic Steamship.

The first ship to cross the Atlantic Ocean wholly propelled by steam was the Royal William, built by a joint stock company at the yard of Campbell & Black in Quebec in 1830–31. The designer of the ship and superintendent of its construction was Mr. James Goudie, who was born in Quebec in 1809 and died in 1892. The ship was launched in the spring of 1831, was towed up the St. Lawrence River to Montreal to receive her machinery, and, on being fitted for sea, her first voyage was made to Halifax, N.S.

For a time she traded between Quebec, Halifax and Boston, and on August 5, 1832, she left Quebec for London. She called at Pictou, N.S., to receive coal and overhaul machinery, and started again from Pictou on August 18 with 7 passengers and a light cargo. She encountered a terrific gale on the Banks of Newfoundland, which disabled one of her engines. The passage from Pictou to London occupied 25 days. Ten days after her arrival in London she was chartered by the Portuguese Government, and in the following year was sold to Spain. She was then converted into a war ship and named the Isabel Sigunda. Among the original owners were the three brothers, Joseph, Henry and Samuel Cunard, of Halifax, N.S., the founders of the famous Cunard Line.

First Railways in America.

The first railway in America was a line from Boston to Quincy, Mass., opened on April 17, 1827. The first railway in America to be operated by locomotives was the South Carolina Railway in South Carolina, United States. It was constructed during the years 1828–30, though trials of an experimental locomotive had been made on the Baltimore and Ohio Railway before the South Carolina road was in operation. In 1828 the Baltimore and Ohio Railway was commenced, and in May, 1830. a section fifteen miles long, from Baltimore to Ellicott's Mills was opened, but horse traction was first used on this line, and it continued to be worked by horse-power until 1832. The first railway charter in Canada was that for a line to connect the traffic on the St. Lawrence with that of the Richelieu River. It was passed in 1832, and the road was opened on July 21, 1836. It extended from Laprairie, nine miles above Montreal, and on the south side of the river, to the town of St. Johns, on the Richelieu. This road, about 18 miles in length, was first operated by horses as the motive power, but in 1837 locomotives were used, and it became a steam railway. A part of the original line is now the road.bed of the Grand Trunk; the latter line, however, leaves the original survey a few miles south of the river and proceeds to St. Lambert instead of Laprairie.

First Telegraph Wire in Canada.

The first telegraph wire strung in the Dominion of Canada was put up by the Toronto, Hamilton, Niagara and St. Catharines Telegraph Company in 1847. It was a simple uninsulated wire. In the same year a line connected Montreal and Quebec. In 1848 Nova Scotia and New Brunswick were supplied with their first telegraph communication. The first electric telegraph office was opened in St. John, N.B., in 1849, the first month's receipts being $56.00.

First Telephone in Canada.

The first telephone line erected in Canada was an experimental one, from the residence of Prof. Grahame Bell's father in Brantford, Ont., to the residence of Rev. T. Henderson in the same city. The first telephone working any distance was one set up by Prof. Grahame Bell between Paris and Brantford. The battery was in Toronto, some 60 or 70 miles away from Paris. The first commercial telephone was established in Hamilton in 1877.

First Electric Cars in Canada.

Electricity was first used as a motive power in Canada in 1883, when a short piece of track was laid on the grounds of the Toronto Industrial Exhibition. The motor was not a success to any great extent. The following year produced the first practical road. In comparison with the modern electric car it would be thought a crude affair, but it ran fairly well, though with the expenditure of a considerable amount of fuel and supplies. In 1885 the track was lengthened, and the overhead wire and trolley arm used. In 1891 the possibility of combating the snow was successfully demonstrated by the Ottawa Electric Railway Company. Montreal followed in 1892, and Quebec in 1897.

The Maple Leaf, the National Emblem of Canada.

Considerable doubt exists as to when the Maple Leaf was first selected as the national emblem of Canada. The tree was held in high esteem by the earliest settlers, and it is more than likely that the maple leaf was popularly accepted as an appropriate emblem long before we have any record of it. In 1806 an article appeared in Le Canadien, from which it would appear that Canadians had then chosen the maple. At the first meeting of the St. Jean Baptiste Society in Montreal, in 1834, the decorations were arranged with maple leaves. In 1836 it was proposed to adopt the maple leaf as an emblem. In 1860, on the occasion of the visit of the Prince of Wales, the emblem was formally adopted. In 1867, at Confederation, the maple leaf was retained.

The Eagle as the U. S. National Emblem.

The eagle was first used as a national emblem for the United States in a device for an armorial achievement for the great seal of the United States offered in 1782 by William Barton, of Philadelphia. Barton submitted two designs, but neither of these satisfying the committee which had the matter in charge, another was submitted by Charles Thomson, the secretary of the Congress. In this design the shield is borne on the breast of an American eagle, on the wing and rising proper; in the dexter talon of the eagle an olive branch, and in the sinister a bundle of arrows. On this design the ingenious Mr. Barton improved and commented, under date of June 19, 1782. He identified the eagle as the American or bald-headed eagle, suggested that the arrows be thirteen in number, and the branch to be palm or olive, and he added: "The escutcheon being placed on the breast of the eagle displayed is a very ancient mode of bearing and is truly imperial; the eagle displayed is an heraldic figure, and being borne in the manner here described supplies the place of supporters and crest; the American States need no supporters but their own virtue and the preservation of their union through Congress. The Congress on June 20, 1782, adopted this design for the great seal, deciding on the olive branch of thirteen leaves and thirteen fruits, and further enacted that "the escutcheon is borne on the breast of an American eagle without any other supporters, to denote that the United States ought to rely on their own virtue."

Origin of "Canada."

The word Canada is derived from the Huron-Iroquois Indian word "Kannata," meaning a collection of huts. In Jacques Cartier's time the territory on the north side of the St. Lawrence River, from Hochelaga, now a suburb of Montreal, to the Gulf, was apparently divided into three districts—Hochelaga, Canada and Saguenay. It is here for the first time we meet the name now borne by our Dominion.

John Bull.

The nickname, "John Bull," is said to be derived from the satire of Dr. Arbithnot, published in 1712, representing the Englishman under that name as a bluff, kind-hearted and bull-headed farmer. In the minds of some it is associated with Dr. John Bull, organist to Queen Elizabeth, and a celebrated musician.

Yankee.

There are several conflicting theories concerning the origin of the word Yankee. The most probable is that it came from a corrupt pronounciation by the Indians of the word English, or its

French form, Anglais. The term Yankee was originally applied only to the natives of the New England States, but foreigners have extended it to all the natives of the United States, and during the American Civil War the Southerners used it as a term of reproach for all inhabitants of the North.

Jingoes.

The term "Jingoes," as applied to that party in any country that are anxious for war, originated in England in 1878 from a music-hall ditty, known as McDermott's "War-song." The opening lines of this song were:

"We don't want to fight; but by Jingo if we do,
We've got the ships, we've got the men, we've got the money too."

The origin of the term is described by George Jacob Holyoake in his "Sixty Years of an Agitator's Life." One Sunday forenoon in March, 1878, a conflict took place in Hyde Park, London, between two factions, one supporting Mr. Gladstone's policy on the Eastern question, and the other supporting the Conservative Government of the day. The latter had taken up McDermott's "War-song," and adopted it as a sort of watch-word, and in a letter to the London Daily News referring to this party, Mr. Holyoake dubbed them "Jingoes." This letter appeared in the News on the morning of March 13, 1878, and the term taking the popular fancy it was at once adopted and was added to the political nomenclature of the day.

The Woolsack.

The Woolsack is the name given to the seat of the Lord Chancellor of England in the House of Lords. It is a large square bag of wool, without either back or arms, and covered with red cloth, the whole forming a kind of cushioned ottoman, standing near the centre of the chamber. According to Brewer, the origin of the Woolsack is as follows: In the reign of Queen Elizabeth an Act of Parliament was passed to prevent the exportation of wool; and that this source of the national wealth might be kept constantly in mind, woolsacks were placed in the House of Peers, whereon the judges sat. Hence the Lord Chancellor, who presides in the House of Lords, is said to "sit on the woolsack."

John O'Groat's House.

The extreme northern part of the mainland of Scotland is called John O'Groat's House after a Dutchman by that name who settled there in the reign of James IV. He is immortalized by the way he settled an open dispute among his nine sons respecting

precedency. He had nine doors made to his cottage, one for each son, and they sat at a round table. Land's End is the most southern point of England, so that from John O'Groat's House to Land's End means from one end of Great Britain to the other.

Gothenburg Liquor System.

The essential feature of the Gothenburg system is that the sale of intoxicating liquors is in the hands of state-controlled and chartered companies, who are allowed only a fixed rate of interest on their capital, and must expend any further profits on objects of general utility. It has been fairly successful in Norway and Sweden, and certainly takes away a great motive for pushing trade. It was advocated in England by Mr. Chamberlain, M.P., and was much discussed in 1876–77. The Bishop of Chester introduced a bill in the House of Lords for establishing the system which was read a first time on March 2, 1893, but was rejected on June 6, following.

Blue Laws.

What are commonly known as Blue Laws are old enactments relating to matters that at the present time are left to the conscience of the individual. Before the American Revolution the statute books of the Puritan colonies of the North, especially Connecticut and Massachusetts, were full of laws enforcing attendance on church service, forbidding smoking in public places, prohibiting theatres and the like. Some of the States, the older ones especially, still retain laws forbidding blasphemy, and regulating work and travel on Sundays. Such Blue Laws as still remain unrepealed in the various States are seldom enforced at the present time.

Gretna Green Marriages.

A Gretna Green marriage is a runaway match. Gretna Green is a village of Dumfriesshire, Scotland, near the head of the Solway Firth, and just across the border from England. At one time clandestine marriages were performed in Fleet Prison, London, by needy chaplains without banns or license, as many as thirty a day being thus consummated. These were, however, suppressed by Lord Hardwicke's Marriage Act of 1754, and in consequence English persons wishing to marry clandestinely had to seek some other method of accomplishing their desire. In England no marriage was valid if either of the contracting parties were under age, without the consent of the parents or guardians, or the publishing of banns, or the presence of a priest. In Scotland, on the other hand, all that was required of contracting parties was a mutual declaration before witness of their willingness to marry. Hence all that was necessary for an English couple anxious to join themselves in

wedlock was to cross the border into Scotland, and as Gretna Green was a most convenient place it soon became "the resort of all amorous couples whose union the prudence of parents or guardians prohibited." In 1856 all irregular marriages were rendered invalid unless one of the parties had been residing in Scotland for three weeks previously; this proviso observed, a Gretna Green marriage is still possible.

Origin of "O. K."

The letters "O. K." signify "all correct," and are the initials of the words "orl korrect," an illiterate spelling of "all correct." Their use is said to have originated with old Jacob Astor, the millionaire, of New York. He was looked upon in commercial circles as a man of great information and sound judgment, and was a sort of general referee as to the solvency or standing of other traders. When he received a note of enquiry as to any particular trader's standing, the answer to which he intended to be satisfactory, he was accustomed to write across the note the letters "O. K." and return it to the writer. These letters he supposed to be the initials of "all correct," and in this sense they are now universally current on the Continent.

Red Cross Society.

The "Red Cross" is the badge and flag adopted by every society, of whatever nation, formed for the aid of the sick and wounded in time of war, recognized and authorized by the military authorities of its own nation, and enjoying certain privileges and immunities under the treaty known as the Convention of Geneva. Hence "Red Cross Society" has become a genuine name for all such voluntary efforts, and cannot be monopolized by any one of them.

Rhodes Scholarships.

The late Cecil Rhodes, in his desire to foster an appreciation of the advantages which would result from the union of the English-speaking people throughout the world, and to encourage in students from the United States an attachment to the country from which they had originally sprung, directed in his will that a part of his fortune be applied for the creation of a certain number of colonial and American scholarships covering a three-years course at Oxford University. By a codicil he established a number of German scholarships for the reason that "a good understanding between England, Germany and the United States of America will secure the peace of the world, and educational relationships form the strongest tie." So that the student who shall be elected to the scholarship shall not be merely a bookworm, regard is to be had not only to his literary and scholastic attain-

ments, but also to "his fondness of and success in manly outdoor sports, such as cricket, football and the like; his qualities of manhood, truth, courage, devotion to duty, sympathy for the protection of the weak, kindliness, unselfishness and fellowship; and his exhibition during school days of a moral force of character, and of instincts to lead and take an interest in his schoolmates, for those latter attributes will be likely in after life to guide him to esteem the performance of public duties as his highest aim." It is also directed that "no student shall be qualified or disqualified on account of his race or religious opinions." The colonial and American scholarships are of the yearly value of £300, and the German £250. The colonial scholarships are allotted as follows: Nine to Rhodesia, 12 to Cape Colony, 3 to Natal, 18 to Australia, 3 to New Zealand, 6 to Canada, 4 to Newfoundland, 3 to Bermuda, and 3 to Jamaica. For the United States there are two for each State and Territory in the Union, and for Germany fifteen in all, five in each of the three years after the founder's death.

Carnegie Foundation Fund.

The purpose of the Carnegie Foundation Fund, as originally announced, was "to establish retiring pensions for teachers of universities, colleges and technical schools in Canada, the United States and Newfoundland, and for the purpose of aiding the cause of education and removing a source of deep and constant anxiety to the poorest paid, and yet one of the highest of all professions." The purposes of the fund have since been further enlarged to provide for the care and maintenance of the widows and families of said teachers, and to make benefactions to charitable and educational institutions, and generally to promote the cause of science and education. The amount of the benefaction is $10,000,000. The trustees of the fund, twenty-five in number, include the heads of the leading universities in the United States, and Dr. William Peterson, principal of McGill University, Montreal.

The Carnegie Hero Fund.

In April, 1904, Andrew Carnegie founded a fund of $5,000,000 for the benefit of "the dependents of those losing their lives in heroic effort to save their fellow-men, or for the heroes themselves if injured only." Provision was also made for medals to be given in commemoration of heroic acts. The endowment, known as "The Hero Fund," was placed in the hands of a commission composed of twenty persons, residents of Pittsburg, Pa. In his letter to the Hero Fund Commission, Mr. Carnegie outlined the general scheme of the fund as follows: "To place those following peaceful vocations, who have been injured in heroic effort to save

human life, in somewhat better pecuniary positions than before, until able to work again. In case of death the widow and children or other dependents are to be provided for until she re-marries, and the children until they reach a self-supporting age. For exceptional children, exceptional grants may be made for exceptional education. Grants of sums of money may also be made to heroes or heroines as the commission thinks advisable—each case to be judged on its merits."

Pidgin English

What is known as "Pidgin English" is a sort of mongrel lingo which is used by Chinese and English-speaking foreigners in the Orient for the purpose of inter-communication when neither party has the means or the wish to acquire an accurate knowledge of the language of the other. "Pidgin" is a Chinese attempt to pronounce our word "business," and the materials of the lingo are nearly all English words similarly represented, though there are a few of Malay, Indian and Portuguese origin. The idiom, on the other hand, is entirely that of coloquial Chinese, and there is also the Chinese absence of inflection and declension.

Grit and Tory.

The use of the word Grit as the name of a political party had its origin in Ontario more than a half a century ago, when the province was known as Upper Canada and when the political issues were almost wholly different from those of the present time. At that time the administration of United Canada was known as the Lafontaine-Baldwin Ministry, and its supporters were generally known as the Reformers. The Ministry proved too conservative for the most ardent reformers in both provinces. By the year 1850 two new parties had become distinctively developed, the "Clear Grits" in Upper Canada, and the "Parti Rouge" in Lower Canada. The "Clear Grits" were the radical wing of the Reform party. Years went by and the political issues changed as well as the men who fought the political battles. Confederation broadened the field of Canadian public life. Upper Canada became the Province of Ontario, and the Reform or Grit party, uniting with the Reformers of the other provinces, became known as the Liberal party.

The word Tory is said to be derived from the Irish Toiridhe, "a purser," a name first given to certain bands of outlaws, half robber, half insurgent, who harassed the English settlements in Ireland. It is used in this sense in Irish state papers of 1656. About 1679, the time of Oates's plot, it began to be applied as a term of approach to the Cavalier or Court party, as supposed abettors of that truped-up conspiracy. Oliver Heywood's Diaries refer,

under the date of October 24, 1681, to "the ranters calling themselves Tories, an Irish title for outlaw persons." which shows that the nick-name was soon adopted by one of the two great political parties in Great Britain—the adherents, namely, of the ancient constitution of England without change, supporters of regal, ecclesiastical, and aristocratical authority. "Their prejudice," said Dr. Johnson, "is for establishment, while that of the Whigs is for innovation." As Whig has been largely superseded by Liberal, so, since 1830, has Tory been superseded by Conservative.

Names of the Months.

The names of the months are taken directly from the Romans. They named the first month Januarius, after Janus, the double-faced deity, who was supposed to be looking backward and forward, to denote the meeting of the past and future. The second month in the year the Romans called Februarius, from the word Februo, meaning to expiate or cleanse. In this month was held a sort of sacred festival, during which the people by ceremonies were supposed to cleanse and purify themselves of their offences. March was named by Romulus in honor of his supposed father, Mars, the god of war. April is derived from the Latin word aperio, meaning to open, and was no doubt given in allusion to the spring season. The month of May was named from the goddess Maia, the mother of Mercury, whose festival was held during the month by the Romans. The origin of the name June is not altogether certain, but the most probable derivation is that it was named from the goddess Juno. July was originally called Quintilis, being the fifth month of the old Latin year. In consequence of alteration in the calendar by Julius Caesar, it became, as now, the seventh month, and its name was changed in complement to Caesar. August, previously called Sextilis, was given its name by Augustus Caesar, who was made Consul during that month. September, being originally the seventh month, took its name from septem, seven, and notwithstanding the numerical change in the order of months, this month and the three following retain their names derived from their number in order: October, octo, eight; November, novem, nine; and December, decem, ten.

The Monthly Birth Stones.

The twelve birth stones and their mottoes are as follows:—January—Garnet, constancy; February—Pearl, purity; March—Hyacinth, fortitude and bravery; April—Diamond, innocence; May—Emerald, wedded happiness; June—Cat's eye, health, wealth and long life; July—Ruby, cure of love's wounds; August—Moonstone, resistance to temptation; September—Sapphire,

steadiness of brain; October—Opal, consolation; November—Topaz, the power of winning friends: December—Turquoise, success in life.

Longest English Word.

The question as to what is the longest word in the English language is one which has given rise to much discussion, and which, as far as we are aware, has never yet been satisfactorily settled. The place of honor is claimed for "nonintercommunicability," which has ten syllables and twenty-three letters. Among other lengthy words may be mentioned "incircumscriptibleness," "nonintervention," "communicability," and intercommunicableness," all of which are given in the Imperial Dictionary and may therefore be accepted as being in good standing.

Dog-days.

The Dog-days are so-called from Sirius, the greatest of the fixed stars in the constellation of Canis Major, or the greater Dog, and include the period from July 3rd to August 11th. During this period this star and the sun rise within the same hour, and the ancients who worshipped the dog attributed the extreme summer to the influence of this constellation—a superstition which has been perpetuated to the present day in the use of the name.

What is a Billion?

In the English system of numeration, a billion is a million of millions, and a trillion is a million of billions. In the French system, which is usually followed in the United States, a thousand million is called a billion, a thousand billion a trillion, and so on. Situated as we are, a British country adjoining the United States, it is but natural that both systems should be in use here, and this, of course, leads to confusion. The English system is defended on the ground that it is at least as convenient and agrees (which the other does not) with the etymological formation of the words—the billion, trillion, quadrillion, etc., being respectively the second, third, fourth, etc., powers of a million. In both systems the million is the same.

Typewriters.

The first type-writing machine, as they are now known, was invented in 1868 by C. L. Sholes, of Wisconsin. Since that time a great many improvements have been effected in them by subsequent inventors, the principal advantages gained being rapidity of execution and legibility. The earliest form of a type-writer was a rude machine invented in England in 1714, and in 1835 F. Foucault sent to the Paris Exposition a writing machine adapted to the uses of the blind.

First English Book Printed.

The first book printed in the English language was not printed in England. William Caxton, the English mercer, carried on business in Bruges. In 1469 he began to translate into English the "Recueil des Histoires de Troye," and to supply the great demand for copies of the book he set himself to learn the art of printing. The "Recueil," the first printed English book, probably appeared in 1474, and may have been printed either at Cologne or in Bruges. In 1475 Caxton printed another work translated from the French. Its title was "The Game and the Playe of the Chesse." This was the second printed English book. Caxton left Bruges in 1476, and set up his press in Westminster, England. Such is one account, but other authorities hold that the book on chess was printed at Westminster and was the first book printed in England. The Encyclopedia Britannica says: "At what date Caxton brought his press to England and set it up at Westminster is quite uncertain. It was probably between 1471 and 1477; 1474 is the date of the Game and Playe of Chesse; but the tradition that this work was printed in England may not be correct."

Facts About the Bible.

In the Old Testament there are 39 books, 929 chapters, 23,214 verses, 590,439 words, and 2,728,109 letters.

The middle book is Proverbs.

The middle chapter is Job xxix.

The middle verse would be 2 Chronicles xx, 18, if there were a verse more, and verse 17 if there were a verse less.

The shortest verse is 1 Chronicles i., 25.

The twenty-first verse of Ezra vii. contains all the letters of the alphabet.

The nineteenth chapter of the Second Book of Kings and the thirty-seventh chapter of Isaiah are practically the same.

In the New Testament there are 27 books, 260 chapters, 7,959 verses, 181,258 words and 838,380 letters.

The middle book is 2 Thessalonians.

The middle chapter would be Romans xiii. if there were a chapter more, and Romans xiv. if a chapter less.

The middle verse is Acts xvii., 17.

The shortest verse is John xi., 35.

The middle chapter of the entire Bible is also the shortest—the 117th Psalm.

The middle verse is the eighth of the 118th Psalm.

Kismet.

Kismet is an Arabic word meaning "fate," or "it is fated." A belief in predestination is one of the fundamental principles in the Mohammedan faith. Not only a man's fortune, but his deeds, and consequently his future reward or punishment are, according to this faith, irrevocably, and thus unavoidably, preordained—a doctrine which has contributed largely to the success of Islam by inspiring its champions with the greatest contempt for the dangers of warfare. When a Mohammedan meets with any disaster or misfortune, no matter how great, he accepts the situation calmly, merely saying, "Kismet"—"it is fated."

The Monroe Doctrine.

The Monroe doctrine is the doctrine of the non-intervention of European powers in matters relating to the American continents. A declaration of this effect was inserted by President Monroe in his seventh annual message to Congress on December 2, 1823, and it was for this reason that the doctrine received its name. The occasion of proclaiming this doctrine was the rumored intervention of the Holy Alliance to aid Spain in the reconquest of her American colonies. President Monroe believed that such a policy entered upon by the allied continental powers of Europe would be dangerous to the peace and safety of the United States; and it was for this reason that he inserted the now famous declaration in his message to Congress. The most important passages to the message were as follows: "We owe it to candor and to the amicable relations existing between the United States and the allied powers, to declare that we should consider any attempt on their part to extend their system to any portion of this hemisphere as dangerous to our peace and safety. . . . . The American continents should no longer be subjects for any new European colonial settlement." This declaration, together with the known hostility of Great Britain to such a project, was sufficient to prevent further action on the part of the alliance. As popularly understood, the Monroe doctrine means a political protection and a guaranty of freedom from European interference to all States of North and South America. It was not, however, intended to do, and by its words it did not declare that the United States would take up arms against European interference on these continents, nor was it its intention to limit or embarrass the policy of the United States in the future. It merely declared that the United States would regard as unfriendly any such acts as European interference with the political affairs of the two Americas, and it is left to be determined by the circumstances of each particular case how far the United States will find it wise to go in opposing it.

Government Of the People, By the People and For the People.

Abraham Lincoln, sixteenth President of the United States, was the author of the sentiment: "Government of the people, by the people, and for the people." These words were uttered by him in a speech delivered in November, 1863, at the dedication of a portion of the battlefield of Gettysburg as a cemetery for those who had fallen there. The oration, known as Lincoln's Gettysburg speech, was as follows: "Four-score and seven years ago our fathers brought forth upon this continent a new nation, conceived in liberty, and dedicated to the proposition that all men are created equal. Now we are engaged in a great civil war, testing whether that nation, or any nation so conceived and so dedicated, can long endure. We are met on a great battlefield of that war. We have come to dedicate a portion of that field as a final resting-place for those who here gave their lives that that nation might live. It is altogether proper and fitting that we should do this. But in a larger sense we cannot dedicate, we cannot consecrate, we cannot hallow this ground. The brave men, living and dead, who struggled here, have consecrated it far above our power to add or detract. The world will little note, nor long remember, what we say here, but it can never forget what we did here. It is for us, the living, rather to be dedicated to the unfinished work which they who fought here have thus far so nobly advanced. It is rather for us to be here dedicated to the great task remaining before us, that from those honored dead we take increased devotion to that cause for which they gave the last full measure of devotion; that we here highly resolve that these dead shall not have died in vain, that this nation, under God, shall have a new birth of freedom, and that government of the people, by the people, and for the people, shall not perish from the earth."

Faiths of U. S. Presidents.

There have been two Congregational Presidents—John Adams, the second President, and John Quincy Adams, his son.

President Roosevelt is the second President of the Reformed Dutch Church, Martin Van Buren having been the first.

Millard Fillmore was a Unitarian, the only Unitarian President.

Washington, William Henry Harrison, John Tyler, Zachary Taylor and Chester A. Arthur were Episcopalians.

There have been five Presbyterian Presidents—Andrew Jackson, James K. Polk, James Buchanan, Benjamin Harrison and Grover Cleveland.

President Garfield was a member of the Church of the Disciples.

Before the civil war there had been no Methodist President of the United States. Since 1861 the following Presidents have been Methodists: Abraham Lincoln, Johnson, Gen. Grant, R. B. Hayes and William McKinley.

Although the Baptist denomination is one of the most numerous in the United States, there has never been a Baptist President, nor has there ever been a Roman Catholic or a Lutheran President.

Roosevelt's Rough Riders.

President Roosevelt was assistant secretary of the United States navy when he organized his regiment of rough-riders during the Spanish-American war. Anticipating a long campaign in a region widely-extended and not over-civilized as Cuba was known to be, where much could be done by a body of expert horsemen mounted on fleet horses in cutting off and surprising the Spaniards, Roosevelt called upon volunteers from sources probably not paralleled in any military annals. In the ranks of the Rough-riders were cowboys, ranchmen, hunters from the Western wilderness, club men and university men. They fought with conspicuous bravery at Santiago de Cuba. They had little opportunity, however, to use their horses as the campaign did not last long enough for them to be employed as "rough-riders." Although not in command of the regiment at first, Roosevelt was eventually made colonel on the promotion of Colonel Wood, who was the first leader of the corps.

Tammany.

Tammany is a New York political organization, having its headquarters in Tammany Hall, the property of the "Tammany Society or Columbian Order." The organization derives its name from an Indian chief who is said to have signed the treaty with William Penn. Washington's Pennsylvania troops chose this chief as their patron saint in place of St. George; and on his "day," May 12, 1789, the society was founded—at first under the name of the Columbian Order, to rival the Cincinnati. The society was founded with benevolent and fraternal purposes, but, being in opposition to the Federalists, it soon identified itself with the Republicans (now the Democratic party), and became a party "machine." In 1805 the Tammany Society was formally incorporated, its professed objects being charity and the extension of the franchise, and in 1811 built its first hall. Since then a local political party, favoured by a majority of the members of the Tammany Society, has always had its headquarters in the home of the society, and has been popularly known as "Tammany Hall." By means of a highly organized system of clubs and assembly district

associations, Tammany Hall has usually held a paramount place in New York politics, though its influence is unquestionably used for the pecuniary benefits of its leaders rather than for the furtherance of any political principle.

The America's Cup.

The America's Cup was originally called the Queen's Cup, and was given by the Royal Yacht Squadron in May, 1851, for a race around the Isle of Wight. The schooner yacht, America, of which Commodore J. C. Stevens, of the New York Yacht Club, was the principal owner, won the trophy on August 22, 1851. The cup then came to the United States, where it has since remained, although contests have repeatedly been held for it since then. Commodore Stevens died in 1856, and by a deed of gift presented the cup to the New York Yacht Club "as a perpetual challenge for friendly rivalry between foreign countries." Canada, in common with other countries, has the privilege of contesting for the owuership of the cup, and did so in 1876, when the Countess of Dufferin, an Ontario-built yacht, competed for it, but unsuccessfully.

Cleopatra's Needles.

Cleopatra's Needles are two Egyptian obelisks, which were originally erected in the Temple of the Sun, in Heliopolis, by Thotmes III., some 3,500 years ago. In the reign of Tiberius they were brought from Heliopolis to Alexandria, and set up in front of the Temple of Caesar. They are of red granite, and are covered with hieroglyphics, which relate the title of Thotmes and his illustrious descendant, Rameses II., who lived two hundred years after Thotmes. One of the obelisks, which long lay prostrate, was, after an adventurous voyage, taken to London in 1878 and set up on the Thames embankment It weighs 186 tons, and is 68½ feet high. The other was presented to the city of New York, through the Department of State, by the Khedive of Egypt. It was brought over to the United States in 1881 at the expense of William H. Vanderbilt, and erected in Central Park, New York. It is 69 feet high and weighs 220 tons.

Bucket Shop.

A bucket-shop is an office where people may gamble in fractional lots of stocks, grain, or other things which are bought and sold on the exchanges. The bucket-shop uses the terms and outward forms of the exchanges, but differs from these in that there is no delivery, and no expectation or intention to deliver or receive securities or commodities said to be sold or purchased.

Limited Liability Company.

The word "limited," when attached to the name of a company or corporation, signifies that the liability of the individual shareholders in the company is limited to the amount of the stock held by them. A limited liability company differs from an ordinary partnership company in this respect: In the ordinary partnership company every member of the firm is held liable for the entire debts of the firm, while in a "limited" company the members, or stockholders, are liable for the debts of the company only in proportion to the amount of the stock held by them. The word limited is required by law to be attached to the corporate name of every limited liability company as a protection to those who may have business dealings with them.

Words in the English Language.

No one can say how many words there are in the English language, because there are so many words of doubtful standing. The Century Dictionary contains about 225,000 words, and the Standard Dictionary lays claim to over 300,000. Of these many are obsolete, and many others are rarely used. The ordinary English vocabulary may be said to contain from 30,000 to 50,000 words, the latter estimate being large. The common estimate of the average vocabulary of educated people is from 5,000 to 6,000.

Paper Required for One Issue of the Family Herald.

The paper used in printing the Family Herald and Weekly Star is 80 inches wide, or sufficient to make four pages placed side by side, that is, there are three sheets of 80-inch paper in each copy. The length of the paper is 2 feet, or 6 feet in each copy. An entire weekly issue runs up to about 150,000 copies, giving a total length of paper of 300,000 feet, or a little over 170 miles. Again, each copy of the Family Herald contains 6 lineal feet of 80-inch paper or 40 square feet. An acre consists of 43,560 square feet, equal to 1089 copies of the Family Herald. Divide 1089 into 150,000 and we get 137 and a fraction, the number of acres in one weekly issue of the Family Herald and Weekly Star.

Confucianism.

Confucianism is termed a religion, but it ought rather to be regarded as a system of social and political life built upon a slight foundation of philosophy. It contains no trace of a personal God. There are, indeed, a number of allusions to a certain heavenly agency or power—Shang-te, but this Shang-te, in the opinion of the most enlightened Chinese scholars, is nothing more than a verbal personification of "the ever-present Law and Order and Intelligence which seem to breathe amid the wonderful activities

of physical creation, in the measured circuit of the seasons, in the alternation of night and darkness, in the ebb and flow of tides, and in the harmonious and majestic revolutions of the heavenly bodies." Confucius lived about 550 B.C. He strove to direct the attention of men to the duties of social and political life, and Confucianism is epitomized in the following words of the great teacher: "I teach you nothing that you might not learn yourselves, viz., the observance of the three fundamental laws of relation between sovereign and subject, father and child, husband and wife, and the five capital virtues—universal charity, impartial justice, conformity to ceremonies and established usages, rectitude of heart and mind, and true sincerity." Confucianism appeals to "practical" men. It lauds the present world; rather doubts, than otherwise, the existence of a future one; and calls upon all to cultivate such virtues as are seemly in citizens, industry, modesty, sobriety, gravity, decorum and thoughtfulness.

Tunkers.

The Tunkers are a religious set commonly known as Dunkards, but by themselves called "the Brethren." Although confined almost entirely to the United States and Canada, the sect had its birth in Germany, being indeed a result of the Pietist movement of the seventeenth century. Between 1717 and 1729 all the members, harassed and persecuted at home, had, on Penn's invitation, removed to Pennsylvania and settled about Germantown and Philadelphia, whence they gradually spread southward and westward. In their creed the Brethren are thoroughly evangelical. Baptism they administer only to adults and by triune immersion, that is, three successive sprinklings or dippings, in the name of the Father, the Son and the Holy Ghost (hence their name, which is the German for "Dippers"). Each congregation is independent, and elects its own deacons, ministers and elders or bishops. Ministers are supported by the church if they are poor or are sent out as missionaries, but as a rule no salaries are paid. Among the peculiarities of the sect are their plain and generally uniform dress, their avoidance of litigation, of war, and of any active share in politics. They take no oaths and so may not join (or if converts remain members of) any secret society. Divorce and re-marriage are unknown among them; they are total abstainers and discourage the use of tobacco.

Agnosticism.

The word agnosticism was introduced into the English language by the late Professor Huxley in 1869. The term was suggested to him by the Greek inscription Agnosto Theo ("To an Unknown God"), which the Apostle Paul saw on an Athenian

altar, as recorded in Acts XVII., 23. Agnosticism may be called the doctrine that man does not know anything about spiritual existence, whether divine or human, or about a future life. In their reasoning against religion the agnostics are careful to guard themselves against positive Atheism on the one hand, and philosophical materialism on the other. They admit that there is more than force and matter in the universe.

Moon Blindness.

Moon blindness or night blindness, as it is sometimes called, is a rare condition in which a person towards evening finds that objects are becoming less and less distinct, and at last he is totally blind. This may occur without previous warning and cause great alarm ; but next morning he finds that his sight is restored. This is repeated every night, but at last the eyes become weak during the day also, and may finally become totally blind. This strange affection is seldom, if ever, met with in this country. It is frequent among the natives of some parts of India, who attribute it to sleeping exposed to the moonbeams. The most probable cause of the affection is, however, exhaustion of the power of the retina, from over excitement, or from excess of light, so that this organ is rendered incapable of appreciating the weaker stimulating action of twilight or moonlight.

Tide in the St. Lawrence.

The ocean tide is noticeable in the St. Lawrence River as far up as the city of Three Rivers, which is 72 miles below Montreal. At Three Rivers spring tide, that is the highest tide, rises to a height of one foot. At Quebec city spring tide rises to a height of 17½ feet.

Watch as Compass and Compass as Watch.

A watch may serve as a compass and, vice versa, a compass as a watch ; but in order not to forget their application, it is necessary to practise frequently. To use the compass as a watch, imagine the rose of the compass divided like a dial, north corresponding with 12, east with 3, south with 6, and west with 6, and hold it with correctly regulated needle in the sun. The pin upon which the needle rests throws a shadow. You need only to double the assumed figure on which the shadow points to find approximately the correct time. For instance, if the shadow of the pin should point at 2, it is 4 o'clock ; if, however, it should point to 10, it is 8 o'clock. In the forenoon 12 must be deducted from the figure previously doubled. To use a watch as a compass it must be held so that its hour hand points toward the sun. In the middle between the time shown by the hour hand and figure 12 lies

south. Thus if the hour hand directed toward the sun points to 4, the figure 2 on the dial indicates south. In the forenoon this southern point is found on the left half of the dial, and in the afternoon on its right half.

To Estimate a River's Width.

To measure the width of any ordinary stream, or even of a good-sized river, it is necessary to make use of only your eyes and the brim of your hat. Select a part of the river bank where the ground runs back level, and, standing at the water's edge, fix your eyes on the opposite bank. Now, move your hat down over your brow until the edge of the brim is exactly on a line with the water line on the other side. This will give you a visual angle that may be used on any level surface, and if, as has been suggested, the ground on your side of the river be flat, you may lay off a corresponding distance on it. To do this you have only to hold your head perfectly steady, after getting the angle with your hat brim, supporting your chin with your hand, if necessary, and turn slowly around, until your back is toward the river. Now, take careful note of where your hat brim cuts the level surface of the ground as you look out over the latter, and from where you stand to that point will be the width of the river—a distance that may readily be measured by stepping. If you are careful in all these details you can come within a few feet of the river's width.

Weight of the Human Brain.

The average weight of the brain of adult males is 49½ ounces, of females 44 ounces. In males, out of 278 cases examined, the maximum weight was 65 ounces, and the minimum weight was 34 ounces. The weight of the brain increases rapidly up to the seventh year. After twenty the increase is slow, and it continues until the person is between thirty and forty years of age, when the brain reaches its maximum weight. Beyond this period as age advances the brain diminishes slowly in weight, about an ounce for each ten years.

The Turbine Engine.

The Parsons' turbine, which was the first turbine invented for the propulsion of vessels at sea, consists of a fixed cylindrical casing, the inside of which is fitted all round with blades, which project inwardly. In the centre of this case revolves the shaft from which power is obtained, and on it is fixed a drum with blades which project outwardly and fit into the blades on the casing. A very small space is left between these blades, and it is through this space the steam forces its way. The blades fixed on the inside of the cylindrical case act as guides to the steam, which strikes with great force against the blades fixed on the drum, causing it to rotate at a high velocity. This drum is keyed on the shaft which drives the propeller.

The Carat.

Pure gold is considered as divisible in respect to purity, into 24 parts, each called a carat, (or karat), an old term for one-twenty-fourth of an ounce, Troy. Hence the phrase 18 carats fine means that 18 twenty-fourths is pure gold, and the remainder an alloy material. Ordinary gold chains and jewellery are usually only 14 carats fine, but wedding rings are usually 22 carats fine.

Smokeless Powder.

Nearly all smokeless powders consist essentially of gun-cotton, or other lower forms of nitro-cotton, acted on by a solvent such as acetic ether or acetone, which reduces the nitro cellulose to a viscid paste; the paste is then rolled out into sheets and the solvent allowed to evaporate; the sheets are left as a dense horny substance, and are cut first into stirps, and then the strips are cut crosswise into grains of any required size, or the substance can be left in strips or in a fibrous form.

Height a Pump will Draw.

An ordinary suction-pump will not, in theory, draw water through a height of more than 34 feet. In practice it rarely operates through a height of more than 28 feet. The principle on which it is based is that the pressure of the air equals the weight of a 34-foot column of water, and if the atmospheric pressure is removed at any point, the water will rise to that height. The work which the suction pump does is to remove the atmospheric pressure, and it can be thus seen that the water will not rise more than 34 feet. In order to get the water to a higher level a force-pump is used. This pushes the water up through a pipe or tube, and the height through which it will work is limited only by the motive power which drives it.

Anchor Ice and Frazil Ice.

In a river which is flowing too rapidly to permit of ice forming on the surface, there is formed instead ice of a very fine quality, commonly known as "frazil" ice, which is drawn down by the current, and carried below the surface ice of quieter reaches farther down the river. This accumulates below the surface ice, and sticking to it, often attains a thickness of from 30 to 35 feet. The accumulation of this sponge ice is one of the chief causes of spring floods, as it blocks up the river-bed, and the water is forced out of the channel.

There is another form of open water ice, namely, "anchor ice." This is formed on the bed of the river, on the rocks or anything in the bed of the river to which ice can be attached, and is caused by radiation of heat waves from the earth. The earth loses heat in greatest degree during the night, and it is at this time that the anchor ice is formed. It is the rapid loss of heat which causes the formation of the ice.

Horse-Power.

Horse-power is the name of the unit in terms of which engineers measure the power of steam-engines, water-wheels, and other prime movers. It is defined to be the rate at which an engine works when it does 33,000 foot-pounds of work per minute, a foot-pound being the amount of work necessary to raise a pound weight a foot high. The name was derived as follows: The first steam engines were employed to do work which had previously been done by horses, and it seemed natural to estimate an engine's working power in terms of that of the horse. This led to the making of a number of experiments in order to ascertain the working power of an average horse. The estimates differed widely, but finally that arrived at by Boulton and Watt was accepted as the standard. From observations of strong London dray-horses working eight hours a day, they found that these animals could walk at the rate of two and a-half miles an hour and at the same time raise a weight of 150 pounds by means of a rope led over a pulley. This is the same as 33,000 pounds raised one foot in one minute, and so the unit was established.

Horse-Power of a Stream.

The best way of finding the horse-power of a stream or waterfall is to multiply the area of its cross-section in square feet, by the velocity in feet per minute. This gives the number of cubic feet flowing along the stream per minute. Multiply this by 62½, the number of pounds in a cubic foot of water, and this by the vertical fall in feet. This gives the number of foot pounds per minute. To get the horse-power, divide this by 33,000.

Candle-Power of a Lamp.

A unit of light, one candle, is the light given out by a sperm candle weighing six to the pound, and burning 120 grains per hour. A wax candle may be weighed, burned five or ten minutes, and weighed again. This will test the candle. If it consumes nearly the proper quantity, it may be used as a standard candle. The candle-power of a lamp is estimated as follows: Fasten a sheet of white paper so that the candle will illuminate it. Place the candle one foot from the paper, and a lead pencil three to four inches from the paper so that its shadow, cast by the candle, will fall on the paper. Now place the lamp to be measured so that the shadow of the pencil, which the lamp will produce, may fall by the side of the shadow cast by the candle. Move the lamp two and fro till the two shadows are of equal intensity. Measure the distance of the lamp from the sheet of paper, in feet and fractions of a foot. The square of this number is the candle-power of the lamp.

Tonnage of a Ship.

The tonnage of a ship depends upon the cubic space it contains. A "register ton" is simply 100 cubic feet of space, and has only very indirect relation to a "dead-weight" ton of 20 cwt. If the entire internal capacity of a ship expressed in cubic feet be divided by 100 the result will be the ship's "gross register" tonnage. What is known as "net register" tonnage is the figure remaining after certain deductions have been made from the gross. It is intended to represent the space actually available in a ship for remunerative service, such as the stowage of cargo or the accommodation of passengers. The meaning of the word displacement, when applied to a ship, is the weight of water displaced by the vessel, this weight being equal to the weight of the ship. The displacement of a ship expressed in tons means the weight of the ship when immersed to her maximum or load-line.

Knot.

A knot is a nautical or geographical mile, and is considerably longer than the statute mile. The geographical mile is one-sixtieth of a mean degree of a meridan on the earth, or 6,080 feet, and is thus 800 feet longer than the statute mile, which is only 5,280 feet. Hence when a ship has gone one knot she has gone 1.1515 statute miles, or what is nearly the same thing, a ship which is running 13 knots an hour is travelling at a speed of 15 statute or land miles an hour. The word knot is derived from the knots tied on the ship's log-line, which, before the patent log now in use was introduced, was the apparatus employed for measuring the speed at which the ship was going.

Locating the Pole Star.

The Pole star is easily located by the aid of Ursa Major, or the Great Bear, one of the most noted and most conspicuous constellations in the northern hemisphere. It is readily distinguished from all others by means of a remarkable cluster of seven bright stars, forming what is familiarly termed the "Dipper," or "Charles' Wain" or wagon, from its fancied resemblance to a wagon drawn by three horses in a line. The two lower stars are known as the "Pointers," because they always point to the pole; if the line which joins them be continued in the same direction some 29 degrees further, it will just reach the Pole Star.

Firing a Gun from a Moving Train.

If a man standing on the rear platform of a train going at a speed of 100 miles per hour, were to fire a gun in the opposite direction, the speed of the bullet being also 100 miles per hour, where will the bullet drop? The bullet would move forward with the motion of the train at a velocity of 100 miles per hour, and backward with a velocity of 100 miles per hour by the force of the powder. It would therefore fall vertically to the ground as if not in motion at all. This is a simple application of Newton's First Law of Motion.

Radium.

Radium was discovered by the French scientist, Mme. Curie, in 1898. It is an elementary metal, but is never separated in metallic form, as it is extremely unstable. Instead, it is prepared in the form of chloride, which is a perfectly stable compound. Radium and its compounds are radio-active, that is, they emit rays analogous in their action to Roentgen and other little known rays, but considerably more feeble. In the field of medicine it has given encouraging results as far as it has been tried, having great power in destroying germs, but owing to its great cost few have been able to investigate its properties. It paralyzes fish, mice, guinea-pigs and many other animals. A single ounce of it, according to Prof. Curie, the husband of the discoverer, would be sufficient to kill all people in Paris if they were brought under its influence separately and under favorable circumstances. It gives out very little light, but extraordinary heat, and will melt its own weight of ice every hour for an indefinite period.

Square Foot and Foot Square.

There is no difference in area between one square foot and one foot square, though there may be a difference in the shape and dimensions of the surfaces. For instance, one square foot may be enclosed by a circular line, a hexagon, a triangle, or a rectangle.

One foot square is an area of fixed form, the four sides being equal and the four angles all right angles. Two square feet and two feet square are not equivalent, either in the dimensions of the sides or the area contained.

Sunday and Sabbath.

There is no definite information as to when the observance of the first day of the week was substituted by the Christians for that of the seventh day, the ancient Jewish Sabbath. It undoubtedly arose among the earlier practices of the Christian Church, and was regarded as the fittest day to be held as sacred, because in the words of one of the Fathers, "it is the first day in which God changed darkness and matter, and made the world; and on the same day, also, Jesus Christ, our Saviour, rose from the dead." Various additional reasons taken from the Old Testament were advanced by others of the early Fathers in support of the observance of this day. The first law, either ecclesiastical or civil, by which the Sabbatical observance of Sunday is known to have been ordained, is an edict of Constantine, A.D. 321, forbidding all work but necessary husbandry on the "venerable Sunday." Since the ninth century, Sunday has been a thoroughly established institution of the Christian Church as a day of rest and religious exercises.

Last Public Execution in Canada.

The last public execution in Canada took place in Ottawa on February 11, 1869, when Patrick James Whelan was hanged for the murder of D'Arcy McGee. During the session of 1869 an act was passed providing that executions of sentences imposing the extreme penalty of the law should take place within the prison walls, and that no one should be present thereat except the necessary officers and certain other persons admitted by special order of the sheriff.

First and Second Cousins.

The children of brothers and sisters are first cousins; the children of first cousins are second cousins, and so on. The child of one's first cousin is a first cousin once removed; the grandchild of one's first cousin is a first cousin twice removed. The child of one's second cousin is a second cousin once removed, and so on. A first cousin once removed is sometimes called a second cousin; a second cousin once removed, a third, etc., but this is wrong. If A and B are cousins, their children would be second cousins. A's children would be first cousins once removed to B.

Origin and Meaning of Proper Names.

The following are a few of the commoner proper names, with their origin and meanings :

MEN.

Adam, Hebrew, red earth.
Albert, Saxon, all bright.
Alexander, Greek, a helper of men.
Alfred, Saxon, wise counsellor.
Andrew, Greek, man.
Archibald, German, bold prince.
Arthur, Celtic, noble.
Cecil, Latin, dim sighted.
Charles, German, noble spirited.
Christopher, Greek, Christ-bearer.
Daniel, Hebrew, divine judge.
David, Hebrew, well beloved.
Denis, Greek, belonging to the god of wine.
Duncan, Saxon, brown chief.
Edgar, Saxon, rich spear.
Edward, Saxon, happy keeper.
Francis, German, free.
Frederick, German, rich in peace.
George, Greek, a husbandman.
Guy, French, a leader.
Harold, Saxon, a champion.
Henry, German, a rich lord.
Herbert, German, a bright lord.
Jacob, Hebrew, a supplanter.
James or Jaques, a form of Jacob.
John, Hebrew, the grace of the Lord.
Laurence, Latin, crowned with laurels.
Luke, Greek, a light.
Matthew, Hebrew, a gift or present.
Michael, Hebrew, who is like God.
Nicholas, Greek, victorious over the people.
Patrick, Latin, a nobleman.
Paul, Latin, small, little.
Peter, Greek, a rock or stone.
Richard, Saxon, stern ruler.
Sampson, Hebrew, a little son.
Samuel, Hebrew, heard by God.
Stephen, Greek, a crown or garland.
Theodore, Greek, the gift of God.
Thomas, Hebrew, a twin.
Timothy, Greek, a fearer of God.

Vincent, Latin, conquering.
Walter, German, a conqueror.
William, German, helmet of resolution.

WOMEN.

Agnes, German, chaste.
Alice, German, noble.
Amy, Amelia, French, beloved.
Anna or Anne, Hebrew, gracious.
Barbara, Latin, foreign or strange
Beatrice, Latin, making happy.
Bertha, Greek, bright or famous.
Catherine, Greek, pure or clean.
Charlotte, French, noble.
Clara, Latin, clear or bright.
Dorothy, Greek, gift of God.
Edith, Saxon, rich gift.
Elizabeth, Hebrew, worshipper of God.
Emily, corrupted from Amelia.
Eva or Eve, Hebrew, causing life.
Florence, Latin, blooming, flourishing.
Frances, German, free.
Gertrude, German, all truth.
Grace, Latin, favor.
Harriet, German, home ruler.
Helena, Greek, light.
Jane or Jeanne, fem. of John.
Julia, Latin, soft haired.
Lilian, Latin, a lily.
Louisa, German, the defender of people.
Lucy, Latin, shining.
Mabel, Latin, lovely or lovable.
Margaret, Greek, a pearl.
Martha, Hebrew, lady.
Mary, Hebrew, bitter.
Matilda, German, a lady of honour.
May, Latin, the month of May, *i.e.*, Maia.
Sarah, Hebrew, a princess.
Susan, Hebrew, a lily.

Victoria Cross.

The Victoria Cross is a decoration that was instituted by Queen Victoria at the end of the Crimean war in 1856, and is conferred upon members of the British naval and military services who have performed, in the presence of the enemy, some signal act of valour or devotion to their country. Non-military persons who have served as volunteers against an enemy are also eligible. The

general distribution of the crosses earned in the Crimean war (to 62 personally) took place in 1857; and the distinction has since been conferred from time to time. The Victoria Cross is in the form of a maltese cross, and is made of bronze. In the centre is the royal crown, surmounted by the lion, and below, on a scroll, are the words "For Valour." The ribbon is blue for the navy and red for the army. On the clasp are two branches of laurel, and from it the cross hangs, supported by the initial "V." An additional act of exceptional bravery may be marked by a bar on the ribbon. The decoration is accompanied, in the case of non-commissioned officers and men, by a pension of ten pounds a year, and five pounds is added for each bar.

The Great Eastern.

The Great Eastern was until recently the largest vessel ever constructed in the world, and even surpassed in some dimensions the huge ocean greyhounds of the present day. She was designed by Mr. I. K. Brunel, the famous engineer, at the instance of the Eastern Steam Navigation Company, and was built by Messrs. Scott, Russell & Co., at Millwall, on the Thames, the launching lasting from November 3, 1857, to January 31, 1858. The ship measured 692 feet in length, 83 feet beam (across paddle boxes, 114 feet), and 58 feet in depth, and had a draught of 20 feet (30 feet when laden). Her propelling power comprised both paddle wheels and screw, the engine of the former having an indicated horse-power of 2,600, and those of the latter 4,000. She is said to have cost £732,000, or over $3,500,000. The Great Eastern started on her first voyage on June 17, 1860, from Southampton, England, crossing the Atlantic in eleven days, and reaching New York on June 28. She made a number of voyages across the Atlantic, and in 1865 and 1866 was employed in laying the Atlantic cable. In 1867 she was chartered to carry passengers from New York to Havre, France, in connection with the Paris International Exhibition, but the scheme proved a failure. From 1869 onward the Great Eastern successfully laid some of the most important telegraph cables across the Atlantic, and in the Mediterranean and Red Seas. After acting as a coal-hulk at Gibraltar in 1884, the gigantic vessel was sold in London by auction for £26,000. Finally, after having been used for a limited time, as a "show" ship, she was sold by auction at Liverpool in November, 1888, to be broken up, the five day's auction fetching £58,000.

The Sphinx.

The Sphinx was a fabulous monster that figured in Grecian and Egyptian mythology. The Grecian sphinx was represented with a body like that of a lion, with wings, and the upper part like

a woman. The Egyptian sphinx was represented with a human head, male or female, and with a lion's body, not winged, which was always in a recumbent position. The most remarkable sphinx in Egypt is the great sphinx, at Gizeh, a colossal form hewn out of the natural rock, and lying about a quarter of a mile south-east of the Great Pyramid. It is sculptured out of a spur of the rock itself, to which masonry has been added in certain places to complete the shape.

Vestal Virgins.

The Vestal virgins were priestesses, having charge of the worship of the Roman goddess Vesta, the goddess of the hearth. The temple of Vesta was in the centre of the city, where she was worshipped under the symbol of the sacred fire watched over by the six Vestal virgins. The duty of the virgins was to keep this fire burning, to bring water from the sacred spring of Egeria for the purification of the temple, to make a sacrifice of salt cakes, to offer daily prayers for the well-being of the state, and to pour on the altar of the sacred fire libations of wine and oil. They were chosen by lot out of twenty selected by the high priest, when not more than ten years of age, and took a vow for thirty years, after which time they were free to return to the world if they chose. In the first ten years the Vestal virgin learned her duties, during the second she practised them, and during the third she taught them to the young Vestals.

Dardanelles.

The strait known as the Dardanelles (the Hellespont of the ancients) unites the Sea of Marmora with the Aegean, a part of the Mediterranean Sea. It is so called from two castles by which the narrowest part is protected, and which preserve the name of the city of Dardanus in the Troad. In terms of the treaty of 1841, confirmed by the treaty of Paris of 1856, no foreign ship of war may enter the strait except by permission of the Government of Turkey, and even merchant vessels are only allowed to pass the defending forts during the day.

Pressgang.

The pressgang was an institution which flourished in Great Britain in the olden times when impressment was the mode resorted to for manning the navy. The practice, which had not only the sanction of custom, but the force of law, consisted in seizing by force, for service in the Royal Navy, seamen, river watermen, and at times landsmen. The pressgang, an armed party of reliable men commanded by officers, usually proceeded to such houses in the seaport towns as were supposed to be the resort

of the sea-faring population, laid violent hands on all eligible men, and conveyed them forcibly to the ships of war in the harbour. Mitigations of the harsh laws on the subject were frequently introduced. As early as 1563 the naval authorities had to secure the sanction of the local justices of the peace; in 1835 the term of an impressed man's service was limited to five years save in urgent national necessity. By that time the system was becoming obsolete, and now the navy is manned by voluntary service. But the laws sanctioning impressment are in abeyance, without being repealed.

Loving Cup.

The "Loving Cup" or "Grace Cup" is a large cup passed around from guest to guest at state and other formal banquets. The custom is said to have been introduced by Margaret Atheling, wife of Malcolm Kenmore, the Scottish king who reigned in the eleventh century. In order to induce the guests to remain for grace, the queen devised the "Grace Cup," which was filled with the choicest wine, and of which each guest was allowed to drink ad libitum after grace had been said.

The Great Wall of China.

This enormous project was conceived by the Emperor Shih Hwang Ti in 214 B.C., for the purpose of keeping the hords of the north out of his domain. It commences at the town of Shan-hai and extends westward to the barrier of Chia-yu, known to the ancient Chinese as the "Gate of the Western Regions." If the wall had been built in a bee line it would have been 1,255 miles in length, but following all its curves and windings the actual length is 1,500. West of the River Ho it is not so imposing, being of a lesser height. Two retaining walls constructed from brick are filled with earth and stones; at the base it is 25 feet wide, gradually narrowing, till at the top it is but 15 feet. The height varies from 15 to 30 feet. On top it is covered with bricks, and at the present time is green with grass.

Minister Without Portfolio.

A minister without portfolio aids and advises the Governor-General just as a Minister with a portfolio does. The only difference between a Minister with and one without a portfolio is that the latter is not charged with the responsibility of a department of the Government. He draws no salary as Minister, and it is, therefore, not necessary in the case of a member of Parliament being appointed Minister without portfolio, that he return to his constituency for re-election.

Jack Sheppard.

Jack Sheppard, the English highwayman and robber, was born in Stepney, London, in 1702. His father was a carpenter, and he himself, at the age of twelve, after a year and a half's schooling in Bishopgate work-house, was apprenticed to a carpenter in Drury Lane. For six years he did well, but falling then into bad company, in July, 1720, he committed the first of many robberies. In the course of the year 1724 he was captured four times, but as often escaped; on the occasion of his third escape from Newgate forcing six great doors. The fifth time he was caught luck deserted him, and on November 18, 1724, he was hanged at Tyburn in the presence, it is said, of 200,000 spectators. He was an ardent and reckless youth, but of a generous disposition, and was certainly the most popular criminal ever led to Tyburn for execution.

The Domesday Book.

The famous Domesday Book of England was compiled during the reign of William I., the Conquerer, who as Duke of Normandy invaded England, defeated the Saxon King Harold and took possession of the throne. In the winter of 1085 William met at Gloucester the Witan, or general council of the kingdom; or as the Chronicle of those times writes: William had "deep speech with his Witan about his lands." The outcome of that "deep speech" in council was a general survey, by which the land property of the kingdom was minutely examined, described and valued, the tenure defined, the holders named, and their dependents numbered and classed. The results are preserved in an extraordinary record, to which was given the name of Domesday, "the book of Judgment that spared no man."

The Commune.

The Paris Commune was an organized band of Socialists who attempted to establish a revolutionary Government in Paris in 1871. Before they were suppressed by the army of the Republic they became absolute masters of Paris, and committed atrocious acts of

cruelty and vaudalism. They arrested the Bishop of Paris and other prominent citizens, shot some of them and imprisoned others. They set fire to the public buildings, aud endeavored to destroy the ancient monuments and treasures of art. In short, they seemed to be possessed with a frenzy of hatred against all government and all order, and wantonly destroyed property and human life. The revolution was finally suppressed on May 27, and 25,000 of the Communists were taken prisoners, some of whom were put to death, while a large number were banished.

Charge of the Light Brigade.

The Charge of the Light Brigade was the celebrated charge made by the Light Brigade of 670 men, under Lord Cardigan, on a Russian battery at Balaklava, on October 25, 1854. The command to charge (about which there has been much dispute), was given to Lord Cardigan by Lord Lucan, in pursuance of orders issued by Lord Raglan. There was a battery in front, a battery on each flank, and Russian riflemen on both sides. According to Cardigan's account (Kinglake), "the time occupied from the movement of the brigade to the attack to the time of reforming on the same ground did uot exceed twenty minntes—the distance passed over was one mile and a quarter, at the lowest calculation—and in that space of time 300 men who had gone into action were killed, wounded or missing, and 396 horses were put hors de combat. Of the 670 men who had gone into action, only 195 were mounted when the brigade re-formed on the ground from which they had moved off, and during the engagemeut twenty-four officers were killed or wounded." Tennyson's lyric on the charge is well known.

The Riviera.

The Riviera is a term applied to the narrow strip of coast-land bordering the Gulf of Genoa, strictly from Nice to Spezzia, but generally understood to include the whole coast of the Department of the Alpes Maritimes, and the Italian coast as far as Leghorn. West of Genoa it is known as the Riviera di Ponente, or western coast, and beyond Genoa the Riviera di Levaute or eastern coast. The western section is the mildest and most frequented. It abounds in the most striking and beautiful scenery, and is planted with numerous pleasure and health resorts—Nice, Monaco, Mentone, Oentimiglia, San Remo and Bordighera.

The Pilgrim Fathers.

The Pilgrim Fathers were a party of English Puritans who had been forced to leave their country on account of their religion, and who emigrated to this continent, settling in Massachusetts. They

had mostly belonged to a sect of Separatists, originating in Yorkshire, but had been driven from their home and had found refuge in Holland. Returning to England for a short time, a company of about a hundred of them set sail for America in the Mayflower on September 6, 1620, with the intention of landing on the banks of the Hudson. Stress of weather prevented them from doing so, for after a long and stormy voyage they were driven to the bleak and desolate shores of Cape Cod. After some exploration of the coast they made a permanent landing on December 21 at Plymouth, a harbour which had already been so named in 1616. The Pilgrim Fathers were all men of rigorous consciences, who loved their fatherland much, but religion more, not driven from home by mercantile necessities or ambitions, but solely by their determination to be free to worship God. They were, as Milton said, "faithful and freeborn Englishmen and good Christians constrained to forsake their dearest home, their friends and kindred, whom nothing but the wide ocean and the savage deserts of America could hide and shelter from the fury of the bishops."

Hanging Gardens of Babylon.

The Hanging Gardens of Babylon were anciently reckoned one of the wonders of the world. Their construction is variously ascribed to Queen Semiramis and to Nebuchadnezzar. There were five of these gardens, each with an area of nearly four acres; they rose in terraces, supported by masonry arches, to a height of 75 feet. They were irrigated from a reservoir built at the top, to which water was lifted from the Euphrates by a screw. Fountains and banqueting rooms were distributed throughout the numerous terraces; groves and avenues of trees, as well as parterres of flowers, diversified the scene; whilst the view of the city and neighborhood was extensive and beautiful. At what time the gardens were destroyed is a matter of doubt, but Pliny says that in his day the scene was one of desolation. Modern explorers have discovered traces of the Gardens.

The Jacobites.

The Jacobites were the adherents of the exiled monarch, James II. of England, from the Latinized form of whose name (Jacobus) they received their designation. Queen Anne, daughter of James II., who had been reared in England as a Protestant, succeeded William III. on the British throne, in virtue of an Act of Parliament, passed in 1689, excluding Roman Catholics from the throne. The Pretender was the name given to James, son of James II., who on the death of his father in 1701, was recognized by the Jacobites as rightful heir to the throne, under the title of James III. The Jacobites founded their hopes on the fact that as

there had been one Restoration, so might there be another, and under this impression they had long an expectation of seeing the Stuarts once more on the throne. Queen Anne died on August 1, 1714, and with her expired the last member of the House of Stuart on the throne of Great Britain.

Greek Church.

The Greek Church had its origin in the great schism between the eastern and the western portions of Christendom which broke out in the fifth century. The Roman dominion was at that time divided into two parts—the eastern empire with Constantinople as its capital, and the western empire with Rome as its capital. Differences of doctrine and practice began to spring up between the churches of the two empires, and in 484 the breach became so wide that the patriarchs of Constantinople and Alexandria were excommunicated by the ecclesiastical authorities of Rome. Reconciliations followed, but they were only partial and temporary. The complete and final separation came in 1054, and since then the Greek Church has had an independent existence. The Greek Church differs from the Church of Rome as to the eucharist, the time of observing Easter, the doctrine of purgatory, making the sign of the cross, the celibacy of the clergy, and the use of the Scriptures by the laity. While differing from the Church of Rome on these points the Greek Church agrees with it in the doctrine of transubstantiation, in praying to the Virgin and saints, and in a modified form of priestly absolution. The Greek Church is the dominant religious organization in Greece, in the Balkan States which lie between Turkey and Russia, and throughout the greater part of the Russian Empire.

Height of the Atmosphere.

From the observations of luminous meteors it has been inferred that the height of the atmosphere is at least one hundred and twenty miles and that, in an extremely attenuated form, it may even considerably exceed two hundred miles.

Paul Revere's Ride.

The famous ride of Paul Revere, the American patriot, from Boston to Lexington, occurred on the night of April 18th, 1775. Revere was one of the party that destroyed the tea in Boston harbor, and he was at the head of a volunteer committee, consisting of thirty young mechanics, who formed a secret society to watch the British. When it was known that the latter intended to move, Revere crossed over to Charlestown, and on April 18, the night before Lexington and Concord, at a signal rode on to

Lexington and to Lincoln, rousing the minute men as he went; at Lincoln he was stopped, but a companion succeeded in reaching Concord. The incident is celebrated by Longfellow in the poem "Midnight Ride of Paul Revere," published in "Tales of a Wayside Inn."

Brother Jonathan.

Brother Jonathan is a general name applied to the people of the United States. Its origin is said to be as follows: General Washington found soon after taking command of the Continental Army that it was sadly in need of many articles. Jonathan Trumbull, the elder, at that time Governor of Connecticut, was a friend of Washington, and one in whose judgment Washington had great confidence. During a consultation on the state of the army Washington suggested that they consult "Brother Jonathan," meaning Trumbull. This advice was followed, and Trumbull devised the means of procuring what was desired. The story was told in the army, and the reply to a demand for any article was invariably the advice to ask "Brother Jonathan." The phrase became proverbial and has lived to the present time.

Stirrup Cup.

A "Stirrup Cup" is a parting cup of wine or other refreshment taken by a mounted horseman. The term originated in the Highlands of Scotland, where it was at one time the custom to give departing guests a farewell cup when their feet were in the stirrups. In the northern Highlands it is called the "cup at the door." Sir Walter Scott refers to the custom in "Marmion":—

> "Lord Marmion's bugles blow to horse;
> Then came the stirrup cup in course;
> Between the baron and his host
> No point of courtesy was lost."

The Chautauqua System.

The Chautauqua Assembly was founded in 1874 by John H. Vincent, D.D., and Lewis Miller, to provide systematic instruction for Sunday-school teachers together with popular lecture courses in literature, science and art. In 1878 the Chautauqua Literary and Scientific Circle was organized. The distinctive mission of this "circle" is stated to be, "to direct the reading habits of grown people, both those who have received the best that the educational institutions can give, and desire to pursue an 'after school course,' and those who for any reason failed to receive a college education in early life, but who now desire to secure to themselves the college student's general outlook upon the world and life, and to develop the habit of close, connected, persistent thinking." The

system comprehends a four years' course of home reading and study, to be pursued under the advisory supervision of the officers of the institution, on the competition of which diplomas are awarded. Post-graduate and special courses are also provided for those who desire to prosecute particular branches of study beyond the limits laid down in the regular course.

Westminster Confession.

In the year 1643 the Long Parliament appointed the celebrated convocation known as the Westminster Assembly, or Assembly of Divines, for the purpose of settling the doctrine, liturgy, and government of the Church of England. It consisted of 121 clergymen and 30 laymen, together with four clerical and two lay commissioners from the Church of Scotland. This notable Assembly held its first meeting on July 1, 1643, and continued to sit till February 22, 1649, during which time it met 1,163 times. The Presbyterians formed a large majority, and exercised a corresponding influence. In doctrine the members were almost unanimous; but on the subject of church government opinions extremely opposite were maintained with keenness, especially on the question touching the sphere and limits of the civil power in matters ecclesiastical. The principal fruits of its deliberations were the Directory of Public Worship, the Confession of Faith, the Shorter Catechism, and the Larger Catechism. These several formularies, which contain a clear and rigid embodiment of Calvinistic theology and Presbyterian church government, constitute to this day the authorized Presbyterian standards.

Hypnotism or Mesmerism.

The terms hypnotism, mesmerism and animal magnetism have been variously applied to designate a mysterious force emanating from one individual and inducing in another person peculiar nervous conditions in which the body and mind were supposed to be influenced. The phenomena of animal magnetism were supposed to be due to some kind of a magnetic force or influence peculiar to living beings and analogous to the action of a magnet upon steel. The name mesmerism was given to the phenomena in honor of one of the earliest investigators, F. A. Mesmer, a German physician. The word hypnotism was proposed in 1841, by James Braid, a Scotch surgeon, settled in Manchester, who investigated the subject with great thoroughness, and this word is now used almost entirely to the exclusion of the other terms. Hypnotism may be defined as an artificially induced somnambulistic state, in which the mind becomes passive, acting readily upon suggestions or directions, and upon regaining normal consciousness retaining little or no recollection of the actions or ideas dominant during the condition.

A Roland for an Oliver.

"A Roland for an Oliver" generally means a blow for a blow, or tit for tat. Sometimes it is a synonym for the matching of one bragging lie against another. Roland and Oliver were two of Charlemagne's most famous paladins, whose exploits were so similar that it is difficult to keep them distinct. What Roland did Oliver did, and what Oliver did Roland did. At length the two met in single combat, and fought for five consecutive days on an island on the Rhine, but neither gained the least advantage. According to some writers, Roland received his death-wound at the hands ot Oliver in the battle of Roncesvalles, A.D. 778.

Standard Time.

Standard time is the time of a certain meridian adopted for local use over a large area, instead of true local time. The differences of local time arise from the use of solar motions as a time-measurer. We call the time noon when the sun is opposite the meridian of the place where we are living, and in consequence of the sun's motion from east to west, the more easterly of two places will have the earlier time. The circumference of the earth is divided into 360 degrees of longitude, and as the sun (apparently) moves round the earth in 24 hours, it passes over 1-24th of 360, that is 15 degrees, in one hour. In other words, 15 degrees of longitude correspond to a time difference of one hour. On account of the vast longitudinal extent of this continent peculiar difficulties in the measurement of time were encountered, and the inconvenience became very serious with the extension of the railway and telegraph systems. To obviate this, the system of standard time was adopted in 1883. According to this, the continent is divided into five longitudinal belts or time-sections, and a meridian of time is fixed for each. These meridians are 15 degrees of longitude, or one hour's time, apart. The time divisions are called Intercolonial time, eastern time, central time, mountain time, and Pacific time. Intercolonial time is used in the belt extending between the 60th and 75th degrees of longitude; eastern time between the 75th and 90th degrees; central time between the 90th and 105th degrees; mountain time between the 105th and 120th degrees; and Pacific time from the 120th degree westwards.

Kilkenny Cats.

Everybody has heard of the two cats of Kilkenny that fought till nothing was left but their tails. Strange as the story seems, there is a substratum of fact upon which it is founded. During the rebellion in Ireland in 1803, Kilkenny was garrisoned by a troop of Hessian soldiers who amused themselves in barracks by

tying two cats together by their tails and throwing them across a clothes line to fight. The officers, hearing of the cruel practice, resolved to stop it, and deputed one of their number to watch. The soldiers, on their part, set a man to watch for the coming officer. One day the sentinel neglected his duty, and the heavy tramp of the officer was heard ascending the stairs. One of the troopers, seizing a sword, cut the tails in two as the animals hung across the line. The two cats escaped, minus their tails, through the open window, and when the officer enquired the meaning of the two bleeding tails being left in the room, he was coolly told that two cats had been fighting and had devoured each other, all but the tails.

National Hymns.

The British National Anthem, as everybody knows, is "God Save the King." This hymn was translated into German by Heinrich Harries, a Holstein clergyman, and sung to the original air at a birthday celebration in honor of the King of Denmark, in 1790; and an adaptation from these words, made in 1793 by Dr. B. G. Schumacher, beginning "Hell dir im Siegerkranz," has ever since been in use as the Prussian national hymn. It called forth the admiration of Haydn, and moved him to compose the Austrian national hymn, which was first sung on the Emperor Franz's birthday, in 1797. The words now used, beginning "Gott erhalte Franz den Kaiser," are by Baron Zedlitz; the original words were by Hauschka.

The Hungarians have two national hymns—the "Szozat" ("The Appeal"), and the "Magyar Hymnusz." The former, beginning "Be true to the land of thy birth," was written by Vorosmarty, the creator of Hungarian poetry of the Romantic school and composed by Benjamin Egressy, an actor and eminent composer of sacred music. The "Magyar Hymnusz" was written by Kolcsey and composed by Francis Erkel.

The Russian national anthem, "Long Live Our Noble Czar," dates from 1830, and is the work of General Alexis Lwoff.

The Danish national hymn is "Konig Christian"; it was written by Edwald and composed by Johann Ernst Hartmann.

There are several claimants to the honor of being the Norwegian national hymn, of which may be mentioned "Soener at Norge," written about the beginning of the nineteenth century, music by C. Blom; and the modern "Ja, vi elsker det Landett" (Yes, We Love This Land), words by Bjornsen, music by R. Nordraak.

The Swedish hymn "King Karl, the Young Hero," was written by Esaias Tegner.

The Dutch national hymn, "Wien Neerlandsch Bloed," was written by Henrik Tollens, and composed by J. W. Wilms.

"La Marseillaise," the national song of the French, was written and composed, in 1792, by Claude Joseph Rouget de Lisle, and received its name from being sung by the volunteers from Marseilles, who took part in the movements in Paris in that year.

The Portuguese "Hymno Constitucional" was composed by Dom Pedro I., Emperor of Brazil.

The United States has no recognized National Anthem, though "Yankee Doodle," "Star Spangled Banner" and "America" are commonly accepted as national airs.

Ladies' Privilege in Leap Year.

The ladies' leap year privilege took its origin in the following manner:—By an ancient act of the Scottish Parliament, passed about the year 1228, it was "ordonit that during ye reign of her maist blessit maiestie, Margeret, ilka maiden ladee, of baith high and lowe estait, shall hae libertie to speak ye man she likes. Gif he refuses to tak hir to be his wyf, he schal be mulct in the sum of ane hundridty pundis, or less, as his estait may bee, except and alwais, gif he can make it appeare that he is betrothit to anither woman, then he schal be free."

Barber's Pole.

Anciently barbers performed minor operations in surgery, and in particular, when bleeding was customary, it was to the barber that the patients applied to be bled. To assist this operation, it being necessary for the patient to grasp a staff, a stick or pole was always kept by the barber-surgeon, together with the fillet or bandaging he used for tying the patient's arm. When the pole was not in use the tape was tied to it, so that they might be both together when wanted, and in this state pole and tape were hung at the door as a sign. At length, instead of hanging out the identical pole used in the operation, a pole was painted with stripes round it in imitation of the real pole and bandage, and thus came the sign.

Man-of-War.

Man-of-war is a phrase applied to a line-of-battle-ship, contrary to the usual rule in the English language by which all ships are feminine. It arose in the following manner:—"Men of war" were heavy armed soldiers. A ship full of them was called a "man-of-war ship." In process of time the word "ship" was discarded as unnecessary, and there remained the phrase "a man-of-war."

A1 at Lloyd's.

A1 is the symbol of a first-class vessel at Lloyd's. The letter "A" refers to the character of the hull of the ship, and is assigned to a new ship for a number of years varying from four to fifteen, according to the material used and the workmanship. After the original term has expired, the "A" may be "continued" for a further specific term, on condition of certain specified repairs, &c. The figure 1 refers to the state of anchors, cables, and other fittings. Vessels of inferior character are classified under the letters AE, E & J. The term A1 is popularly used to denote anything of undoubtedly good quality.

Per Cent. Mark.

Many speculations have been made as to the origin of the mark % for per cent., but none seem to be so feasible as the following: If it be granted that the figures "oo" designate centum or hundred, which they certainly do, as the figures 1, 2 and 3 placed before them only signify the number of hundreds, as 1 hundred, 2 hundreds, and so on; and if it be remembered that one of the meanings of per is "through," then the diagonal line drawn through or between the two ciphers will give us the exact meaning of the symbol %, a line drawn through, or "per," "oo" (centum).

Prince of Wales.

The title of Prince of Wales originated with Edward I. After he had subdued the Welsh, he promised them if they submitted without further opposition to give them a Prince who was born amongst them, and who could speak no other language. Upon their acquiescence he bestowed the title of Prince of Wales upon his son Edward, then an infant, born in Wales, and unable to speak any language. From that time the title has always been conferred upon the eldest son of the sovereign of Great Britain.

Sandwiches.

Sandwiches are so called from the Earl of Sandwich who introduced them about a century ago. Dr. Brewster says he "passed whole days in gambling, bidding the waiter bring him for refreshment a piece of meat between two pieces of bread, which he ate without stopping from play."

Selah.

This word, which occurs so frequently in the Book of Psalms, is usually believed to be a direction to the musicians who chanted the Psalms in the Temple. Mattheson, the great musical critic, wrote a book on the subject, in which, after rejecting a number of theories, he came to the conclusion that it is equivalent to the modern "da capo," and is a direction that the air or song is to be repeated from the commencement to the part where the word is placed. If this be so, the custom of reading the word as though it were a part of the text is of course incorrect.

Blue Nose.

This is a popular name for a native of Nova Scotia. Haliburton, in "Sam Slick," gives the following account of its origin:—"'Pray, sir,' said one of my fellow-passengers, 'can you tell me the reason why the Nova Scotians are called Blue Noses?' 'It is the name of a potato,' said I, 'which they produce in the greatest perfection, and boast to be the best in the world. The American have, in consequence, given them the nickname of Blue Noses.'"

Hic Jacet.

This is a Latin phrase often seen on tombs. Its meaning is "here lies," or "here he lies."

Origin of the Word Farm.

The word is derived from the Anglo-Saxon word feorm, meaning supper, food, or hospitality. Originally tenants held lands in consideration of supplying their lords with certain specified quantities of food or other necessaries for the use of the manorial household, and this was called the "ferme." Afterwards this was commuted into money payment, which was called "ferme blanche," from being paid in silver or white money. Still later the rent was called "ferme" simply, and eventually the land from which the rent was derived was called the "ferme," or "farm."

Days of the Week.

The English names of the seven days of the week are derived from those of pagan deities, or natural objects of worship to which each day was dedicated; thus: Sunday, Sun's day. Monday, Moon's day. Tuesday, from Tuisto or Tuesco, a Saxon god. Wednesday, Woden's day, from Odin or Woden, also a Saxon idol. Thursday, Thor's day. Thor was worshiped by all the northern European nations. Friday, Friga's day, from Friga, the Scandinavian Venus. Saturday, Saterne's day.

Ei or Ie.

This combination is very puzzling, even to persons well acquainted with orthography. A simple rule is that "ei" should always follow the consonants "c" and "s," as receive, seize, &c., and "ie" should follow all other consonants, as belief, thief, &c. There are, however, two exceptions to this rule, the words sieve and siege.

Eurasian.

This word, which is often met with in Indian newspapers, is applied to persons born of European fathers and native mothers. The word is a contructed combination of the two words "European" and "Asian."

Hornpipe.

The musical instrument called the horn was originally, as its name indicates, made from the horn of an ox or cow. Some were drilled with holes at regular distances, similar to those in a flute. These were called horn-pipes, and the ancient dance known as the hornpipe was so named from its having been originally danced to the music from one of those rude instruments.

I.E.

"Id est" is Latin, and means "that is." The initials of this phrase, the letters "i.e.," are commonly met with. They are to be read as "that is," or "that is to say."

Bran-new.

Bran-new is brand-new; that is, so new that the mark or brand of the maker is not worn away or rubbed off.

Chiltern Hundreds.

The Chiltern Hills are a range of chalk hills in the south of England, separating the counties of Bedford and Hertford, and passing through the middle of Bucks, to Henley and Oxfordshire. They comprise the Hundreds of Burnham, Desborough and Stoke. They were formerly much infested by robbers. To protect the inhabitants from these marauders, an officer of the Crown was appointed, under the name of the "Steward of the Chiltern Hundreds." The duties have long ceased, but the office—a sinecure with a nominal pay—is still retained. A member of the House of Commons cannot resign, but acceptance of office under the Crown vacates his seat. Whenever, therefore, an M.P. wishes to retire, he applies for this office, which being granted him as a matter of course, his seat in Parliament becomes vacant; and he holds the office until some other member wishes to retire.

Foolscap Paper.

This term has not, as is generally believed, any reference to the water-mark of a cap and bells. The word is a corruption of "folio shape."

Height of Goliath.

The height of Goliath, according to Samuel, was "six cubits and a span." Mr. Greaves gives the length of the cubit as 21 inches, and the span 9 inches. This would make Goliath's height about 11 feet 3 inches.

"Hear, Hear!" in the Scriptures.

This is a Scriptural phrase. It occurs in 2 Samuel 20:16: "Then cried a wise woman out of the city: Hear, hear!"

Best One Hundred Books.

Sir John Lubbock, the well-known scientist and philosopher, in his book, "The Pleasures of Life," names the following as the best one hundred books worth reading: The Bible, Meditations of Marcus Aurelius, Teachings of Epictetus, Aristotle's Ethics, Analects of Confucius, St. Hillaire's Le Bouddha et sa Religion, Wake's Apostolic Father, Imitation of Christ by Thomas a Kempis, Confessions of St. Augustine, Portions of the Koran, Spinoza's Tractacus Theologico-Politicus, Pascal's Paensees, Butler's Analogy of Religion, Taylor's Holy Living and Dying, Bunyan's Pilgrim's Progress, Keble's Christian Year, Plato's Dialogues, Xenophon's Memorabilia, Aristotle's Politics, Demosthenes' De Corona, Cicero's De Officialis, De Amicitia, and De Senectute, Plutarch's Lives, Berkley's Human Knowledge, Descarte's Discour sur la Methode, Locke on the Conduct of the Understanding, Homer, Hesoid, Virgil, Mahabharata, The Shaneman (Persian poem), the Nibelungenlied, Maloray's Mort d'Arthur, The Sheking (Chinese poem), Kiladasa's Sakuntala, Aeschylus' Prometheus and Triology of Orestes, Sophocles' Oedipus, Euripides' Medea, Aristophanes' The Knights and Clouds, Horace, Chaucer's Canterbury Tales, Shakespeare, Milton's Paradise Lost, Comus and Shorter Poems, Dante's Divina Commedia, Spencer's Faerie Queen, Dryden's Poems, Wordsworth, Burns, Pope's Essay on Criticism, Essay on Man, Rape of the Lock, Byron's Childe Harold, Gray, Tennyson, Herodotus, Xenophon's Anabasis, Thucydides, Tacitus' Germania Livy, Gibbon's Decline and Fall, Hume's History of England, Grote's History of Greece, Carlyle's French Revolution, Green's Short History of England, Lewes' History of Philosophy, Arabian Nights' Entertainment, Gulliver's Travels, Defoe's Robinson Crusoe, Vicar of Wakefield, Cervantes' Don Quixote, Boswell's

Life of Johnson, Moliere, Schiller's William Tell, Sheridan's Critic, School for Scandal and Rivals, Carlyle's Past and Present, Bacon's Novum Organum, Smith's Wealth of Nations, Mill's Political Economy, Captain Cook's Travels, White's Natural History of Selborne, Darwin's Origin of Species and Naturalist's Voyage, Mill's Logic, Bacon's Essays, Montaigne's Essays, Addison's Essays, Emerson's Essays, Edmund Burke's Select Works, Smiles' Self Help, Voltaire's Zadig and Micromegas, Goethe's Faust and Autobiography, Thackeray's Vanity Fair, Thackeray's Pendennis, Dickens' Pickwick Papers, Lytton's Last Days of Pompeii, George Eliot's Adam Bede, Kingsley's Westward Ho and Scott's novels.

Blue Stockings.

The term "blue stockings" is given to learned and literary ladies who display their acquirements in a pedantic manner. The name is derived from a literary coterie formed in London about the year 1750. A distinguished member of this society was a certain Mr. Stillingfleet, who was in the habit of wearing blue stockings—knee breeches and stockings were then the characteristic dress of gentlemen—and all the ladies connected with it voted that he should be the only male creature admitted to their society. The story getting abroad, the literary society was called the Blue Stocking Society, and finally literary and learned women like Mrs. Chepone, Mrs. Carpenter and Miss Martineau were called "blue stockings."

Hall of Fame.

On March 5, 1900, the New York University accepted a gift of $100,000, afterwards increased to $250,000, from a donor, whose name was withheld, for the erection and completion on University Heights, New York City, of a building to be called "The Hall of Fame for Great Americans." A structure was accordingly built in the form of a semi-circle, 170 feet, connecting the University Hall of Philosophy with the Hall of Languages. On the ground floor is a museum 200 feet long by 40 feet wide, consisting of a corridor and six halls to contain mementoes of the names that are inscribed above. The colonnade over this is 400 feet long with provision of 150 panels, each about 2 feet by 6 feet, each to bear the name of a famous American. Only persons who have been dead ten or more years are eligible to be chosen, and 15 classes of citizens were recommended for consideration. Fifty names were to be inscribed on the tablets at the beginning, and five additional names every fifth year thereafter, until the year 2000, when the 150 inscriptions will be completed. In case of failure to fill all the panels allotted the vacancies are to be filled in a following year.

The Scott Act.

The Scott Act is the name by which the Canada Temperance Act, 1878, is commonly known, and so called after the Secretary of State, R. W. Scott, who introduced it. The act provides that any county or city may petition the Governor-General-in-Council praying that the act shall be put in force in such county or city. Such petition must be signed by at least one-fourth of all the electors in the district applying. A proclamation is then to be issued, naming a day on which the votes of the electors are to be taken for or against the adoption of the petition, at which election only persons qualified to vote at the election of a member of the House of Commons are entitled to vote. If the adoption of the petition is carried, an order-in-council may be issued bringing into force that part of the act which provides "that no person shall, within county or city, by himself, his clerks, servant or agent, expose or keep for sale, or directly or indirectly, on any pretence or upon any device, sell or barter, or in consideration of the purchase of any other property, give to any other person any intoxicating liquor." Certain provisions are made for the sale of wine and intoxicating liquor for sacramental, medicinal and mechanical purposes, and for the disposal of the manufactures of brewers and distillers. Such order-in-council cannot be revoked until after the expiration of three years, and then only on a similar petition and election, and if the result of the first election is against the adoption of the petition, no similar petition shall be put to the vote for a like period of three years. It is also provided that every person who, by himself or another, violates the above provision against the sale of intoxicating liquor, shall, on conviction, be liable for the first offence to a fine of $50; for the second offence, $100; and for the third and every subsequent offence, imprisonment not exceeding two months.

Black Friday.

The term "Black Friday" was first used in England, and was applied to the Friday on which the news reached London that Edward, the young Pretender, had arrived at Derby. This created a terrible panic. On May 11, 1866, the term was again used in London, when the failure of Overend, Guerney & Co., on the previous day, was followed by a widespread financial ruin. In September, 1869, occurred the celebrated Black Friday in the United States. The cause of the panic was the attempt made by Jay Gould and others to create a corner in the gold market by buying all the gold in the banks of New York City, amounting to $15,000,000. For several days the value of gold rose steadily, and the speculators aimed to carry it from 144 to 200. On the Friday following (September 24) the whole city was in a ferment; the

banks were rapidly selling, gold was at 162 1-2 and still rising. Men became insane, and everywhere the wildest excitement raged, for it seemed probable that the business houses must be closed from ignorance of the prices to be charged for goods. But in the midst of the panic it was reported that Secretary Boutwell, of the United States treasury, had thrown $4,000,000 in gold on the market, and at once gold fell, and the excitement ceased. It is estimated that the profits of Gould and his partners were at least $11,000,000.

Canadian V. C's.

For conspicuous bravery during the action at Komati River, on the 7th November, 1900, the following members of the Canadian contingent to South Africa during the Boer war, were awarded the Victoria Cross: Lt. H. Z. C. Cockburn, R. C. D., Lt. R. E. W. Turner, R. C. D., Sergt. E. J. Holland, R. C. D.

Knots.

A knot is a nautical or geographical mile and is considerably longer than the statute mile. The geographical mile is one-sixtieth of a mean degree of a meridian on the earth, or 6080 feet, and is thus 800 feet longer than the statute mile, which is only 5280 feet. Hence when a ship has gone 1 knot she has gone 1.1515 statute miles or what is nearly the same thing, a ship which is running 13 knots an hour is travelling at a speed of 15 statute or land miles an hour. The word knot is derived from the knots tied on the ship's log-line which, before the patent log now in use was introduced, was the apparatus employed for measuring the speed at which the ship was going.

Mason and Dixon's Line.

This line was originally the parallel of latitude 39 deg., 43 min., 26.3 sec., which separates Pennsylvania from Maryland. It received its name from Charles Mason and Jeremiah Dixon, two English mathematicians and astronomers, who traced the greater part of it, between the years 1763 and 1767, though the last thirty-six miles were finished by others. It was practically the dividing line between the free and the slave States in the East. During the discussions in Congress on the Missouri Compromise (which dealt with the question of slavery in that State on its admittance to the States Union), John Randolph, of Roanoke, Virginia, the celebrated statesman, made free use of the phrase "Mason and Dixon's Line," and thereafter it became popular as signifying the dividing line between free and slave territory through the country. The boundary, as thus extended by popular usage, followed the Ohio River to the Mississippi, and west of that was the parallel of 36 deg., 30 min., the Southern boundary of Missouri, though Missouri itself was a slave State.

Legion of Honour.

The Legion of Honour is an order of merit instituted by Napoleon in 1802, as a recompense for military and civil services. It was ostensibly founded for the protection of republican principles and the laws of equality, every social grade being equally eligible. The constitution and incidents of the order have been repeatedly changed by the successive executive powers of France. At the first institution the order embraced four classes; to these a fifth was added in 1852. At the same time the star which was the original decoration was changed into a five-rayed white enamelled cross. On the obverse of this is a female head representing the republic, surrounded by the words "Republique Francaise, 1870"; on the reverse are two crossed flags and the motto: "Honneur et Patrie." The cross is suspended by a wreath, half of oak, half of laurel, leaves. No ignoble punishment can be inflicted on a member so long as he belongs to it, and each medal entitles its bearer to a pension of 100 francs annually.

Fruit or Vegetable.

In botany, a fruit of a flowering plant is the matured seed-vessel and its contents, together with such accessory parts as become finally incorporated with them. Thus, in the botanical sense, not only apples, pears, peaches, tomatoes, figs, etc., but all berries, nuts, grains, beans, peas, pumpkins, squashes, cucumbers and melons, as well as pine-cones, the samaras or winged seeds of the maple, ash or elm, and many other products are fruits. Popular usage has, however, become much narrower. The grains have been dropped, and the tendency is to drop nuts also, so that a fruit is now generally understood to be the fleshy and juicy product of some plant, usually tree or shrub (and nearly always containing the seed), which when ripe is edible without cooking, and adapted for use as a dessert rather than as a salad. The quince, however, though usually cooked before eating, is classed among fruits, and we sometimes speak of poisonous fruits as the berries of the night-shade. A vegetable, in the popular sense, is any part of a herbaceous plant commonly used for culinary purposes, and may consist of the root, as in the beet and turnip; the stem, as in the asparagus, celery or rhubarb; a tuber, or underground stem, as in the potato; the foliage, as in cabbage and spinach; or of that which is botanically the fruit, as in the tomato, bean, pea and egg plant. Thus the tomato is both a fruit and vegetable, though for table use and in the garden and market it ranks as a vegetable only. In like manner the pumpkin and squash, which are botanically fruits, are classed as vegetables; while the melon, which is of the same family, is termed a fruit.

RECIPES.

Cloudy Mirror.

A mirror may become cloudy from either of two reasons—it may become covered with fine scratches, or else too strong a light falling on it may damage the silvering. In the latter case it will have to be resilvered. In the former case the scratches may be almost completely removed by rubbing the part affected with a piece of soft leather moistened with water and dipped in rouge. If there is much to do, it will save time to set up a buff wheel made of wood and grind out the scratches with fine pumice stone and water, and then polish with a felt buff and rouge with water.

Galvanized Iron.

The term "galvanized iron" is a misnomer, for the iron is not galvanized, but merely coated with metallic zinc. It is, nevertheless, a term which is universally employed, and so we are obliged to use it, even though we know it to be wrong. To galvanize iron, the surface is first cleaned of all scale, rust, dirt or oil; if oily, it is boiled in a solution of caustic soda, and the scale and rust removed by a bath of dilute hydrochloric acid, one part of acid to two or four of water, according to the thickness of the iron. If necessary, the iron is scrubbed with a wire brush and sand. It is then dipped in a hot solution of half a pound of sal ammoniac to a gallon of water, and dried quickly. After drying, it is immersed in a bath of melted zinc, on the surface of which a little powdered sal ammoniac has been sprinkled to clear it. Judgment is required to know the length of time for the immersion and the temperature of the melted zinc. Very small work should be immersed but a few seconds.

Tin Plate.

The so-called tin of which such articles as kettles, pans, milk cans, etc., are made is more correctly known as tin-plate, for it is simply sheet iron coated with tin. The iron used for making these plates is made either of charcoal-bar or coke-bar, or sometimes of mild steel, which has been rolled with particular care, in order to avoid scales on the surface. When the iron has been cut to the required size, the plates are "pickled," i.e., they are immersed in hot dilute sulphuric or hydrochloric acid to remove all oxide. After this the plates require to be washed several times in water, and then annealed. The plates are next passed two or three times through chilled iron rollers highly polished with emery and oil, to give them a well-polished surface. Once more they are sent to the annealing furnace, passed again through dilute sulphuric acid,

which is followed by another washing, but this time in running water, and then scoured with sand. This should leave them quite clean and bright. Each plate is now put singly into a pot of melted grease (which has become sticky by use), and left till it is completely coated, after which the plates are taken in parcels and plunged into a bath of melted tin covered with grease, called the "tin pot." The plates are afterwards put in parcels into the first of two compartments of a vessel, where they receive a coating of purer tin than that of the "tin pot," and are then withdrawn one by one, and wiped on both sides with a hemp brush, the marks of which are obliterated by another dipping in the second compartment of the "washpot." This last dipping also gives the plates a polish. The superfluous tin is removed by immersing the plates in a pot containing tallow and palm-oil, maintained at a temperature just high enough to allow the tin to run off. The final treatment consists in working the plates separately in troughs of bran with a little meal and then rubbing them with flannel.

Soldering a Lead Pipe.

Soldering a lead pipe is like a good many other operations—it is easy when you know how, but exceedingly difficult when you don't. The reason for this is that unless the soldering bolt is of the proper temperature, and properly handled, it is very apt to melt a hole in the lead pipe and so make matters worse instead of better. The edges of the part to be soldered should be scraped bright and clean and powdered rosin used as a flux. The bolt must not be too hot, and great care must be taken not to allow it to approach too near the pipe for fear of melting it. The proper way is to hold it directly above the place to be soldered and touching it with the solder allow the latter to drop on the spot desired. Failure will probably attend the first attempt, but practice will make perfect.

Soldering.

Ordinary soft solder, an alloy of tin and lead, is best adapted for soldering most metals, with the exception of cast-iron. worked in the various industries. Its composition varies very much, about equal parts of the metals being taken : 2 parts of tin to 1 of lead furnish what is called "weak, soft solder," and 2 parts of lead to 1 of tin "strong, soft solder." A copper bolt is used for soldering. The point is tinned by first heating it, then filing off the point clean, touching it with soldering fluid and then rubbing it on the solder. This operation has to be repeated from time to time, as the solder on the copper gets burned off. Soldering fluid is prepared as follows : Mix ten parts of hydrochloric (muriatic) acid with five of water, and add gradually to the mixture five parts of zinc cut up in small pieces. It is best to use an earthenware or

glass vessel with a wide neck, and on account of the gas generated being poisonous to perform the work in the open air. When all the zinc has been added stir frequently with a wooden rod during the first day; the next day heat the vessel gently by placing it in hot water or hot sand, and then place the mixture aside for clearing. In a few days pour off the clear fluid and add a solution of half a part of sal ammoniac (chloride of ammonium) in two of water, stir thoroughly and put the liquid in earthen jars or glass bottles. The zinc remaining in the vessel is rinsed off with water, dried, and kept for future use. If a stronger liquid is desired, the last two parts of water may be omitted and the solution of zinc.

Solder for Broken Saws.

A good solder for mending broken saws is made as follows: File to a powder clean brass, 3 parts; pure silver, 28½ parts; pure copper, 1½ parts. Mix thoroughly. Put the saw on an anvil, the broken edges in contact. Put a line of the above mixture along the seam, cover with powdered charcoal. Take a spirit lamp and a blowpipe, hold the coal dust in place, and blow just enough to melt the solder. Set the joint smooth with a hammer, and file away the superfluous solder.

Brazing Iron and Steel.

For brazing large pieces of iron or steel, copper or brass is used as solder. Place a thin strip of copper or brass along the junction, bind the pieces together with wire, and cover them an inch deep with clay free from sand. For soldering iron to iron bring the pieces, when dry, to a white heat, and then plunge them into cold water; for iron or steel to steel cool slowly from the white heat The vitrified clay is then broken off. For smaller articles prepare a solder by granulating a mixture of eight parts of brass with one of zinc. Mix this solder with borax and spread it over the articles to be joined. For very small articles a solder is prepared by melting together six parts of brass, one of zinc, and one of tin. The solder is beaten into thin plates, which are applied, together with borax, to the surfaces of the articles to be soldered.

Magic Solder.

There is a so-called magic solder sold by peddlers, and composed of 1 part of bismuth, 3 parts of tin, and 2 parts of lead, melted together at a moderate heat and cast in slender sticks. This fuses very readily, and while by no means a strong solder, may be used for trifling repairs. The surface to be soldered must be clean and free from grease, and should be moistened before the solder is applied with soldering liquid, prepared by dissolving zinc in muriatic (hydrochloric) acid.

Frosting Glass.

A simple method of frosting glass is to rub it over with a little bag of muslin filled with fine sand, powdered glass, or grindstone grit and water. Some sand may be placed directly on the glass. A good imitation is obtained by gently daubing the glass over with a piece of glazier's putty, stuck on the end of the fingers. When applied with a light and even touch, the resemblance is considerable. Or, put a piece of putty in muslin, twist the fabric tight and tie it into the shape of a pad; clean the glass well and then pat it over. The putty will exude sufficiently through the muslin to render the glass opaque. Let it dry and then varnish. If a pattern is required, cut it out in paper as a stencil: place it so as not to slip, and proceed as above, removing the stencil when finished. If there should be any objection to the existence of clear spaces, these may be covered with a slightly opaque varnish.

Drilling Glass.

Glass can be drilled with a hard drill and spirits of turpentine. This is a tedious process, suitable only for making small holes. Glass may also be drilled by the following process: First make a saturated solution of camphor in spirits of turpentine; then make a spear-shaped drill the size of the hole required. Heat the drill to a white heat and plunge into mercury, and it will then be very hard. Then sharpen on an oilstone and fasten the drill in a bradawl-handle or in a brace. Dip the end of the drill in the solution of camphor and turpentine and work the drill as if you were working it through wood. Keep the drill well moistened with the solution, and sharpen it when blunt.

To Transfer Pictures to Glass.

Prints or pictures of any kind may be transferred to glass so as to make a sort of transparency, in the following manner. First coat the glass with damar varnish or with Canada balsam mixed with an equal volume of oil of turpentine, and let it dry until it is very sticky, which takes half a day or more. The printed paper to be transferred should be soaked in soft water and carefully laid

upon the prepared glass, after removing surplus water with blotting paper, and well pressed upon so that no air bubbles or drops of water are seen underneath. This should dry a whole day before it is touched ; then with wetted fingers begin to rub off the paper at the back. If this is skilfully done, almost the whole of the paper can be removed, leaving simply the ink upon the varnish. When the paper has been removed, another coat of varnish will serve to make the whole more transparent.

To Remove Scratches on Glass.

Slight scratches on glass may be partially removed by rubbing the part with a piece of soft leather moistened with water and dipped in rouge. If it is a deep scratch it will have to be ground out with the finest emery, such as is used by opticians, and the spot polished with rouge and water upon a piece of soft leather. If you have much to do, it will save time to set up a buff wheel made of wood and grind out the scratches with fine pumice stone and water, and then polish with a felt buff and rouge with water.

Dressing Skins for Fur.

To prepare skins for fur, first thoroughly wash the skin, and remove all fleshy matter from the inner surface, then clean the hair or wool with warm water and soft soap, and rinse well. Take a quarter of a pound of common salt, the same of powdered alum, and half an ounce of borax, dissolved in hot water, and add sufficient rye meal to make a thick paste, which spread on the flesh side of the skin. Fold it lengthwise, flesh side in, the skin being quite moist, and let it remain for ten days or two weeks in an airy and shady place, then shake out and remove the paste from the surface, and wash and dry. For a heavy skin a second application may be made. Afterwards pull and stretch the skin with the hands, or over a beam, and work on flesh side with a blunt knife. The following is another method : After cutting off the useless parts and softening the skin by soaking in warm water take away the fatty part from the inside, after which soak the skin in tepid water for two hours. Mix equal parts of borax, saltpetre, and Glauber salts (sulphate of soda) in the proportion of about one-third of an ounce for each skin, with water enough to make a thin paste, and spread with a brush over the inside of the skin, applying more on the thicker parts than on the thinner. Double the skin together, flesh side inwards, and lay in a cool place. After twenty-four hours, wash the skin clean and apply the following mixture in the same manner as before : 1 oz. sal soda, ⅓ oz. borax, and 2 ozs. hard white soap, melted slowly together without being allowed to boil ; fold the skin together again and put in a warm place for twenty-four hours. After this dissolve 3 ozs. alum, 7 ozs. salt, and 1½ ozs.

saleratus in sufficient hot rain water to saturate the skin; when cool enough not to scald the hands, soak the skin in it for twelve hours, wring out and hang up to dry. When dry repeat the soaking and drying two or three times till the skin is sufficiently soft. Lastly smooth the inside with fine sandpaper and pumice stone. A third process is as follows: Stretch the skin tightly and smoothly upon a board fur side down, and tack it by the edges to its place. Scrape off loose flesh and fat with a blunt knife, work in chalk freely, with plenty of powdered alum, wrap up closely, and keep in a dry place for a few days. Finally soften by gently rubbing and beating.

To Prepare and Dye Sheepskins.

To prepare sheepskins for mats or other purposes, wash while fresh in strong soapsuds, first picking from the wool all the dirt that will come out. A little coal oil, say a tablespoonful to three gallons of water, will aid in removing the dirt. Continue to wash the skin in fresh suds till it is white and clean, then wash in pure water till all the soap is taken out. Dissolve one pound each of salt and alum in two gallons of hot water, and put the skin into a tub sufficient to cover it; let it soak for twelve hours, then hang on a line or over a pole to drain. When nearly dry, stretch it carefully, wool side in, on a board, and stretch it several times while drying. Before it is quite dry, sprinkle on the flesh side one ounce each of finely powdered alum and saltpetre mixed together, rubbing the mixture in well. If the skin is a very large one, use double the quantity of the mixture. Try if the wool be firm; if not, let it remain a day or two, then rub again with alum; fold the flesh sides together, and hang it in the shade for two or three days, rubbing it every day till perfectly dry. Then with a blunt knife clean the skin of impurities and scrape it well, rub with pumice, or rotten stone, and trim into shape, and your mat is ready. To dye sheepskin brown, proceed as follows: The quantities given are for ten pounds of skins, and must be varied according to the weight to be dyed. Place the skins over night in water heated from 115 to 140 degrees Fahr., and containing sufficient ammonia to make them smell of it. Take them out the next day and wash them. Now exhaust two pounds of logwood by boiling it several times and dilute the liquor to five gallons. Place the skins in the bath for three hours, then take them out and let them drain off. Next place them in a bath of wood vinegar, and move them occasionally. Then take them out, rinse and dry them in a fresh bath heated to 140 degrees Fahr., and containing 1¾ ounces of Bismarck brown; take them out, let the liquor drain off, rinse, and then dry the skins at a moderate heat and rather slowly. It is best to lay the skins flesh side upon a board, as this will prevent shrinking. The skins

when dry, must undergo further treatment to render them soft and pliable. For this purpose mix bran to a homogenous paste with tepid water, and to every 2½ gallons add 3½ ounces of glycerine. This mixture is applied to the skins, and when dry, brushed off again.

Making a Bearskin Mat.

To tan a bearshin for a floor mat, the following will be found satisfactory. First remove all useless parts and soften the skin by soaking. Remove all fatty matter from the inside and soak in warm water for an hour. Then mix equal parts of borax, saltpetre and sulphate of soda in the proportion of ½ oz. each for each skin to be treated, with sufficient water to make a weak paste; spread this over the inside of the skin with a brush, applying more to the thicker parts than to the thinner. Double the skins together, flesh side inside, and put in a cool place. After letting them stand twenty-four hours, wash the skin clean, and apply in the same manner as before, a mixture of 1 oz. sal soda, ½ oz. borax, and 2 ozs. of hard, white soap, melted slowly together without being allowed to boil. Fold each skin together and put away in a dry place for twenty-four hours. Next dissolve 4 ozs. alum, 8 ozs. salt and 2 ozs. saleratus in sufficient hot water to saturate the skins. When cool enough not to scald the hands, place skins in it and allow them to remain for twelve hours; then wring out and hang up to dry. When dry repeat soaking and drying several times to make skins soft. Lastly, smooth inside of skins with fine sandpaper and pumice stone.

Chamois Leather from Sheepskin.

Chamois leather is made from sheepskin by the following process: The sheepskin is first washed and the flesh side scraped thoroughly to remove the fleshy fibers; then the wet skins are hung in a warm room for about a week and "sweated." This loosens the wool so that most of it can be pulled out easily. The skins are then soaked in milk of lime to loosen the rest of the wool, and to swell the fibers and split them into their constituent fibrils. After liming, the hair is all removed and the absorbed lime is neutralized with boric or hydrochloric acid, and the skin is split into two thicknesses. The outer, or grain side is used for the mannfacture of thin, fancy leathers, used in bookbinding, etc., while the flesh side is made into wash leather. It is first drenched, then put into stocks and pounded until it is partly dried and the fibrous structure has become loose and open, sawdust generally being employed to facilitate the process. Fish oil is now rubbed upon the skins in small quantities, as long as the oil is absorbed. The moisture dries out as the oil is absorbed, the skins being hung up occasionally and exposed to the air. When the skins have absorbed

enough oil they lose their limy odour and acquire a peculiar mustard-like smell, due to the oxidation of the oil. They are then packed loosely in boxes, where they heat rapidly, and must be taken out and exposed to the air to prevent overheating. During this time they give off much pungent vapour and turn yellow. They are then washed in a warm solution of alkali to remove the excess of fat. The skins are next bleached in the sun, being moistened occasionally with a solution of potassium permanaganate, followed by washing with sulphurous acid or sodium peroxide. The leather is then permanently softened and suited for all purposes of toilet or cleansing uses.

Removing Hair and Wool from Hides.

To remove the hair or wool from hides, they are soaked in a solution composed of eight quarts each of slaked lime and wood ashes, in ten gallons of water. The hides are allowed to remain in this liquor until the hair or wool pulls off easily. At the proper time the hides are withdrawn from the solution and stretched over an unhairing beam, and the hair and scarf-skin scraped and shaved off. The flesh side is then treated with a fleshing knife, which removes the fatty compounds and flesh. The hides are then gone over with a scudding knife, to press out the combined lime and interfibrous matter of the tissue, and are ready for the actual tanning. Instead of using the lime, the hides are sometimes depilated by a process known as "sweating." In this the hides, after having been soaked to soften them, are laid in heaps for a short time, and afterwards hung in a heated room, by which means a slight putrefactive action is started, and the hair becomes so loose as to be easily detached.

Tanning with Oak Bark.

The first operation in making tanned leather is to soak the skins or hides in water for a longer or shorter time, to wash and soften them. In order to be thoroughly soaked green hides should remain in the water from nine to twelve days, depending on the thickness of the hide. They are then soaked in the following liquor in order to remove the hair or wool: Cold soft water, ten gallons; slaked lime and wood ashes, of each eight quarts. Soak until the hair or wool will pull off easily. Instead of using the lime, the hides are sometimes depilated by a process known as "sweating." In this the hides after the first soaking are laid in heaps for a short time, and afterwards hung in a heated room, by which means a slight putrefactive action is started, and the hair becomes so loose as to be easily detached. When the lime process is followed, the hides at the proper time are withdrawn from the pits and stretched over an unhairing beam and the hair and scarf-

skin scraped and shaved off. The flesh side is then treated with a fleshing knife, which removes the fatty compounds and flesh. The hides are then gone over with a scudding knife to press out the combined lime and interfibrous matter of the tissue, and are ready for the actual tanning. When oak bark is used a series of pits is prepared, the first containing an infusion of bark almost entirely deprived of tannin, but in which some amount of gallic and tannic acids have been developed, and which contain a large proportion of the colouring matter extracted from the tanning substances. There are usually four or six of these pits, and as the hides are moved forward on the series they are exposed to a liquor containing a small and steadily increasing proportion of tannin. The hides are moved daily from one to another of these pits, this process usually occupying about a week, after which they are placed in the lay-away pits, where they are exposed to the strongest tanning liquors, layers of the tan-bark being at the same time strewn between them. The hides are allowed to remain in these pits for about six weeks, after which the pits are cleared out, charged with fresh liquor, and filled with the hides and tan as before. These processes may be repeated three or four times before the tanning is completed. Heavy hides for sole leather, belting and similar purposes require very little further treatment when removed from the tan pits. They are piled grain to grain and flesh side to flesh side to drain, brushed or scoured, rubbed lightly with oil, and put away to dry. Hides intended for dressing purposes, such as for shoes and harness, require somewhat different treatment to free them from lime after unhairing. They are thoroughly washed in water, and are then steeped for a week or ten days in an infusion of pigeon's dung in warm water. The subsequent tanning operations do not differ essentially from those already described. After being taken from the tan pits the leather has to be curried to render it smooth, soft and pliable, and to give it a suitable surface-dressing, colour and finish.

Indian Tan for Buckskins.

The following is the Indian method of tanning buckskins for moccasins : Take a skin, either green or well soaked, and flesh it with a dull knife. Spread it on a smooth log and grain it by scraping with a sharp instrument; then rub nearly dry over the oval end of a board held upright. Take the brains of a deer or calf, dry by the fire gently, put them in a cloth and boil until soft ; cool off the liquid until blood warm, with water sufficient to soak the skin in, and soak until quite soft and pliable, and then wring out as dry as possible. Wash in strong soap suds and rub dry and smoke well with wood smoke. Instead of brains, oil of lard may be used and the skin soaked therein six hours.

To Soften Skins.

Fur skins that have become hard are rendered soft and pliable by the following process. Bran is mixed to a homogeneous paste with tepid water, and to every 2½ gallons 3½ ounces of glycerine are added. This mixture is applied to the skin, and when dry brushed off again, and the skin pulled and rubbed until it becomes soft. Another preparation that is sometimes used consists of the yolks of three eggs mixed with 3½ pints of water and 1 ounce of Epsom salts.

Whitewash.

An excellent whitewash which is very durable is made as follows : Slake half a bushel of lime with boiling water, covering the vessel during the process to keep in the steam. Strain the liquid through a fine sieve, and add 8 quarts of salt previously dissolved in warm water, 2½ pounds of ground rice boiled to a thin paste and stirred in boiling hot, half a pound powdered Spanish whiting, and one pound of clean glue, which has been previously dissolved by soaking it well, and then put the whole mixture in a small kettle within a large one filled with water, and hang over a slow fire. Add five gallons of hot water to the mixture, stir it well, and let it stand for a few days covered from the dust. It should be put on quite hot, and for this purpose it should be kept in a boiler over a portable furnace. It answers as well as oil paint for wood, brick or stone and is much cheaper. Colouring matter, with the exception of green, may be added, and the paint made of any desired shade.

Kalsomine.

Soak one pound of white glue over night, then dissolve it in boiling water and add 20 pounds of Paris white, diluting with water until the mixture is of the consistency of rich milk. To this any tint can be given that is desired. Lilac—Add to the kalsomine two parts of Prussian blue and one part of vermilion, stirring the mixture thoroughly and taking care to avoid too high a colour. Brown—Burnt umber. Gray—Raw umber, with a trifling amount of lamp black. Rose—Three parts of vermilion and one part of red lead, added in very small quantities until a delicate shade is produced. Lavender—Make a light blue and tint it slightly with vermilion. Straw—Chrome yellow with a touch of Spanish brown. Buff—Two parts of spruce, or Indian yellow, and one part of burnt sienna. Blue—A small quantity of Prussian blue will give a soft azure tint. Dark blue is never desirable. Delicate tints in the foregoing varieties of colours are always agreeable and tasteful, and so great care must be taken that they are not too vivid. The tints will always appear brighter than in the kalsomine pot, and this fact must be kept in mind when adding the colouring powders.

Cheap Paint.

A cheap and durable paint is prepared as follows: Boil for fifteen minutes in an earthenware pot 1 part of soft curd of milk and 3 parts of water. Pour the mass through a colander, wash it with cold water, and press out the water in a linen cloth. To 1 part of the curd add ¼ part of unslaked lime and ¾ parts of water. The fat slime thus formed is triturated in oil or water with the various pigments. Ochre, chrome, yellow, Berlin blue, indigo, lead and zinc are best adapted for colouring substances. If the paint is to be used on wood add 1-10th part of linseed oil. The mixture dries very quickly, is entirely without odour, and costs about a third of ordinary oil paint. A cheap floor paint may be made as follows: Soak two ounces of good glue for twelve hours in cold water, and then melt it in thick milk of lime (prepared from one pound of caustic lime) heated to the boiling point. To the boiling glue stir in linseed oil until it ceases to mix. About 8¾ fluid ounces of oil is sufficient for the above proportions. Too much oil is corrected by the addition of lime paste. Mix this with any colour not affected by lime, and dilute with water if needed. For yellow-brown or brown-red colours, boil in the ground colour a quarter of its volume of shellac and borax, making an excellent paint for wooden floors. This mixture is easily applied, covers well, and is a great deal cheaper than the ordinary paint.

Paper-Hanging.

To prepare the walls of a room for papering, first give them a coat of weak size. An excellent paste for paper-hanging is made as follows: Put a couple of pounds of fine flour in a pail and add cold water gradually till it forms a thick paste, stirring well all the while. Add about a dessertspoonful of finely-powdered alum to prevent the paste becoming mouldy, and then pour in gradually with constant stirring, about six quarts of boiling water, or sufficient to bring the paste to a proper consistency. This is fit for use when cold.

Bicycle Enamel.

An excellent black enamel for bicycles is made as follows: Take of asphalt 40 ounces, boiled linseed oil ½ gallon, litharge 6 ounces, powdered zinc sulphate 4 ounces; melt the asphalt, add the other ingredients, boil two hours, then stir in 8 ounces fused dark amber gum, and one pint hot linseed oil and boil two hours longer. When the mass has thickened remove from the fire and thin with one gallon of turpentine. This will not stick to the nickeled parts of the bicycle nor to the old enamel, both of which will have to be removed before applying the new enamel.

Copal Varnish.

The following are two reliable recipes for copal varnish. 1. Dissolve 1 part of camphor in 12 parts (by weight) of ether; to the solution add 4 parts of clear copal, powdered fine. Leave the mixture in a moderately warm place in a well-stopped bottle, frequently agitating until the copal is partially dissolved. Then add 4 parts of absolute alcohol and ¼ of a part of essence of turpentine. The result should be a viscous liquid, almost homogeneous. If this be set aside for a few days it will separate into two, the lower of which contains more copal, while the upper will be found to give the more brilliant varnish, although it is as limpid as water. 2. Grind copal to a fine powder, and pour ammonia over it until the whole mass is swelled up. Heat this to a temperature of about 100 deg. F., then add alcohol until the mixture is of the desired consistency.

Shellac Varnish.

Shellac Varnish may be made by dissolving shellac in rectified naphtha or wood spirit. Put one ounce of shellac into a wide-mouthed bottle with five ounces of the spirit, cork and stand in a warm place until the gum is dissolved, shaking frequently to aid solution. When completely dissolved, filter the varnish, adding more spirit to assist the filtering, and changing the filter from time to time.

Linseed Oil Varnish.

Linseed oil varnish is made by boiling together linseed oil, 60 parts; white litharge, 2 parts; white vitriol, 1 part; each of the last two ingredients being finely powdered. Boil until all the water is evaporated, and then set aside to cool.

Stove-Pipe Varnish.

Any asphaltum varnish can be used for stove-pipes and the following is as cheap as any. Take of asphaltum, 2 pounds; boiled linseed oil, 1 pint; oil of turpentine, 2 quarts. Fuse the asphaltum in an iron pot, boil the linseed oil and add while hot. Stir well and remove from the fire. When partially cooled add the turpentine.

Writing Inks.

A good black ink is made as follows: Take of bruised Aleppo nut galls 2 pounds, water one gallon. Boil in a copper vessel for one hour, adding water to make up for that lost by evaporation, strain, and again boil the galls with a gallon of water; then strain, mix with two liquors, and add immediately ten ounces of copperas in coarse powder, and eight ounces of gum arabic. Agitate until solution of these latter is effected, add a few drops of a solution of potassium permanganate, strain through a piece of hair cloth, and

after permitting it to settle, bottle it. The addition of a little extract of logwood will render the ink blacker when first written with. Half an ounce of sugar to the gallon will render this a good copying ink. 2. An excellent blue-black ink is obtained by the following process: Take 4½ ounces bruised Aleppo gall nuts, not gnawed by insects, 1 drachm powdered cloves, 40 ounces cold water, 2½ ounces purified sulphate of iron, 35 grains purified sulphuric acid, and ¼ ounce sulphindigotic acid in the form of a paste, and either entirely neutral or nearly so. The gall nuts are placed together with the cloves in a flask capable of holding about four gallons, the cold water is poured over them, and they are allowed to digest for several days, with frequent shaking, but without heat being applied. The fluid is then filtered, the sulphate of iron added and when entirely dissolved, the sulphuric acid is poured into the mixture and the whole shaken. Finally the sulphindigotic acid is added and mixed by shaking, and the whole filtered. Another blue-black writing ink is prepared by triturating six parts of Prussian blue and one part of oxalic acid with a little water, to a perfectly smooth paste, then diluting with a proper quantity of soft water. 3. Carmine ink is made by dissolving six parts of carmine in 5 parts of spirit of sal-ammoniac, previously diluted with its own bulk of water, and when the carmine is dissolved adding two parts of tartaric acid. The mixture is allowed to stand for two or three days, when the supernatant red fluid is poured off. The sediment is filtered, the ink adhering to it being drained off.

Violin Varnish.

The famous Italian violin makers, it is said, used the following sort of varnish on their instruments: Rectified alcohol, half a gallon; gum sandarac, six ounces; gum mastic, three ounces; turpentine varnish, half a pint. The above ingredients are put into a tin can by the stove and frequently shaken until the whole is well dissolved. It is finally strained and kept for use. If upon application it is seen to be too thick, thin with the addition of more turpentine varnish. The wood should be stained before applying the varnish.

Gold Ink.

Gold ink is made in this way: Triturate equal parts of honey and gold leaf in a mortar until the gold is reduced to the finest possible state of division, agitate with thirty parts of hot water, and repeat the washing several times. Finally dry the gold and mix it with a little weak gum water for use.

Writing on Zinc.

Permanent writing on zinc may be effected by using one of the following mixtures: (1) Mix verdigris, 1 part; sal ammoniac, 1 part; chimney black or any mineral colour, ½ part; water, 10 parts; stir well or shake the bottle before using, and employ a quill, not a steel pen, for writing. This ink is a poison. (2) Squeeze the juice out of a lemon into a pot and put into it an old copper coin. Let it stand for a day or two. Write with a quill. (3) Dissolve 100 grains of chloride of platinum in a pint of water. A little mucilage and lampblack may be added.

Ink for Stone or Marble.

Ink for use on stone or marble is made by dissolving Trinidad asphaltum in oil of turpentine, using equal parts of each. This is used in a melted state for filling in letters cut on tombstones, marble slabs, etc. It is very durable.

Violet Copying Ink.

A blue violet copying ink is made by dissolving in 300 parts boiling water, methyl violet 5B. Hofman violet, 3B, or gentiana violet B. For reddish violet, use methyl violet BR. A small quantity of sugar added to these inks improves their copying qualities. If the writing, when dry, retains a bronzy appearance, more water must be added.

Sympathetic Inks.

The following are some of the more easily prepared sympathetic inks, that is, which are colourless when written with, but which appear when subjected to the action of some reagent. 1. White with a solution of hydrochlorate of ammonia in the proportion of 15 parts to 100 of water. The writing will become blue by the application of iodine. The characters written with lemon, onion, leek, cabbage, or artichoke juice, become visible when the paper is heated. 3. Write upon rose-coloured paper with a solution of chloride of cobalt. The writing becomes blue on heating and disappears on cooling. 4. Milk makes a good invisible ink, and buttermilk answers the purpose better. It will not show if written with a clean, new pen on unglazed paper (as in the case of all the other inks mentioned), and ironing with a hot flat iron is said to

show it up well. 5. If writing be done with solution of acetate (sugar) of lead in distilled water, the characters will appear in black upon passing a solution of an alkaline sulphide, as sulphide of potassium, over the paper. 6. Writing executed with rice water is invisible when dry, but the characters become blue by the application of iodine. The ink was much employed during the Indian mutiny.

Ink Powders.

Various qualities of ink in the solid state are prepared as a convenience for travellers, so as to avoid the necessity of carrying bottles and the risk of breaking them. They are mostly composed in the case of black ink, of finely-pulverized constituents of gall-nut ink, over which cold water is poured, but such ink as a rule is pale in colour and poor. The best substance for preparing a good black ink powder is aniline black, which can be readily dissolved in 80 parts of water, and furnishes at once an excellent writing fluid. Of the other preparations the following are among the most commonly used: (a) Extract of logwood, 150 parts; bichromate of potash, 1½ parts. Pulverize and mix thoroughly with two parts of indigo blue. (b) Nutgalls, 1 pound; sulphate of iron (copperas or green vitriol), seven ounces; gum arabic, seven ounces. Pulverize and mix. This amount of powder will make one gallon of good black ink. Two or three cloves should be mixed with each pound of powder to prevent moulding. (c) Aleppo galls, three pounds; copperas, one pound; gum arabic, half pound; white sugar, quarter pound; powder and mix. Two ounces of this powder dissolved in one pint of boiling water gives a very fair ink. For coloured inks, the basis of the powders is generally an aniline colour. For carmine, forty parts of eosine, three of lunar caustic, and seven of gum arabic. For green, forty-four parts of aniline green, four of gum arabic, and two of lunar caustic. For purple, forty parts of aniline violet, four of gum arabic, and two of lunar caustic. The substances are separately powdered and then mixed. Any quantity of the powder is taken and dissolved in a corresponding quantity of pure water, requiring about an hour for solution.

Household Soap.

Very good household soap is made by the following method: Take exactly ten pounds of double refined 93 per cent. caustic soda powder, and put in a can or jar with 4½ gallons of water, stir it once or twice, when it will dissolve immediately and become quite hot; let it stand until the lye thus made is cold. Weigh out and place in any convenient vessel for mixing, exactly 75 pounds of clean grease, tallow or oil (not mineral oil). If grease or tallow be used, melt it slowly over the fire until it is liquid and just warm; if oil be used, no melting is required. Pour the lye slowly into the

melted grease or oil, in a small stream continuously, at the same time stirring with a flat wooden stirrer about three inches broad; continue gently stirring until the lye and grease are thoroughly combined and in appearance like honey. Do not stir too long, or the mixture will separate itself again; from fifteen to twenty minutes will be enough. When the mixing is completed pour off the liquid soap into any old square box sufficiently large to hold it, previously dampening the sides with water so as to prevent the soap sticking. Wrap up the box well with old blankets, or, better still, put it in a warm place until the next day, when the box will contain a block of 130 pounds of soap, which can be afterwards cut up with a wire. Remember the chief points in the above directions, which must be exactly followed. The lye must be allowed to cool; if melted tallow or grease be used, it must not be more than warm; the exact weights of caustic soda and tallow or grease must be taken: the lye must be stirred into the grease, and not vice versa. If the grease or tallow used be not clean, or contain salt, it must be purified by boiling in water, and allowing it to become hard again. Any salt present will spoil the whole operation, but discoloured or rancid tallow is just as good as fresh. If the soap turn out streaky and uneven it has not been thoroughly mixed. If very sharp to the taste, too much soda has been used. If soft, mild and greasy, too small a quantity of soda has been used. In either case it must now be thrown into a pan and brought to a boil with a little water. In the first case, boiling is all that is necessary; in the other instance, a very little oil, or a very little more of the caustic soda must be added. Beef tallow makes the hardest soap; mutton fat a rather soft soap. Of oils, cotton seed is the cheapest and best, but the soap is much softer, lathering very freely indeed. Ordinary household fat, or dripping, makes a very good soap. If the grease or tallow used be not clean or contains salt, it must be rendered, or purified, previous to use, that is to say, boiled with water and allowed to become hard again to throw out the impurities. Discoloured or rancid grease or tallow is just as good as fresh for soap-making purposes.

Toilet Soap.

The basis of the better qualities of toilet soap is generally curd or yellow soap, in the making of which special precautions are taken to ensure absence of free alkali. This is most important, as otherwise the soap would be altogether unsuitable for toilet purposes, the free alkali being injurious to the skin. This is the reason why so many of the cheaper laundry soaps produce chapped hands and similar results when used for toilet purposes. If, on the other hand, there is an excess of fat, the soap is greasy and does not possess the cleansing properties a good soap should. A

laundry soap may be made without much difficulty by an amateur, but it is better to buy whatever toilet soap is required, for the reasons stated, and also because special apparatus is required to make a soap of first-class quality.

Soft Soap.

A very good domestic soft soap is made as follows: Take seven and a half pounds of potash, ten pounds grease and thirty-seven and a half gallons water. Dissolve the potash in part of the water, and half of the grease, and heat. Mix in the remainder of the grease, put in a barrel and add the remainder of the water a little at a time, for several days. Stir often. This will be ready for use in about two weeks.

Carbolic Soap.

It is better for an amateur to buy carbolic soft than to attempt to make it, as the process is a somewhat difficult one, and the results are apt to be unsatisfactory. Here is one formula which you might try: Half palm soap, 20 lbs.: starch, 1 lb.; carbolic acid in crystals, 1 oz.; oil of lavender, 2 ozs.; oil of cloves, 1 oz. The carbolic acid and essential oils are added to the soap in a melted state and thoroughly incorporated.

Soap Powder.

All hard soaps may be reduced to powder when perfectly dry by trituration with a pestle and mortar, but the operation is generally confined to cosmetic soaps for shaving and other purposes. The soap is cut into thin shavings, and these are laid upon sheets of paper in a drying room, or dried in any other convenient way. As soon as the shavings become brittle they are ready for powdering. Small quantities at a time are carefully reduced to a powder in a mortar, and the powder is passed through a fine sieve. All coarse particles retained by the sieve are then pulverized and sifted as before, until the whole quantity is fine enough to pass through the sieve. The powder is kept in a wide-mouthed jar or bottle, and should be well covered.

Shoe Blacking.

The following is the method of preparation of one of the best known shoe blackings on the market. Very finely ground animal charcoal, or bone black is mixed with sperm oil till the two are thoroughly commingled. Raw sugar or molasses, mixed with a small portion of vinegar, is then added to the mass. Next, a small measure of dilute sulphuric acid is introduced, which, by converting into sulphate, a large portion of the lime contained in the animal charcoal, thickens the mixture into the required pasty con-

sistence. When all effervescence has subsided, but while the compound is still warm, vinegar is poured in until the mass is sufficiently thinned, when it is ready to be bottled for the market.

Liquid Shoe Polish.

A very good liquid shoe polish is made as follows: Mix together half an ounce each of indigo and gelatine, one ounce of logwood extract, two ounces curd soap, eight ounces softened glue, and one quart vinegar. Heat the whole over a slow fire, and stir until thoroughly mixed. Apply with a soft brush and polish with a woollen cloth.

Paste for Patent Leather.

A paste for dressing patent leather shoes, etc., may be made by adding to some pure wax, which has been melted in a water bath, some olive oil, and then some lard. Mix thoroughly by stirring over a moderate fire. Add some oil of turpentine, then a little oil of lavender. This will form a paste which should be put in boxes. Apply the paste to patent leather with a linen rag. The paste keeps the leather soft and restores the gloss.

Paste Blacking.

A cheap paste blacking for boots and shoes is made by mixing one pound of molasses, one pound and a quarter of ivory black, and two ounces of sweet oil. Rub well together, and add a little strong vinegar.

Dressing for Ladies' Shoes.

French dressing for ladies' shoes is prepared as follows: Dissolve 3 ounces logwood extract in 2 quarts of water. In another vessel dissolve 3 ounces of borax in 2 quarts of soft water, add ¾ ounce shellac and boil till it is dissolved. In a third vessel dissolve a quarter of an ounce of bichromate of potash in a quarter of a pint of soft water, and add 3 ounces ammonia water. Finally mix all three solutions together. The following is a German recipe: Dissolve 3½ ounces of shellac in half a pint of alcohol. Rub smooth 25 grains of lamp-black with 6 drachms of cod liver oil, and mix. A few drops are to be applied to the leather with a sponge.

Dubbing for Leather.

A good dubbing which is very efficacious in preserving leather and rendering it waterproof, is made by melting together equal parts of mutton fat and linseed oil, with one tenth their weight of Venice turpentine. The mixture should be applied to the leather, when it is quite dry and warm. There are many other formulæ for dubbing, but all contain essentially the same ingredients.

Castor oil is excellent for preserving leather. Applied once a month, once or twice a week in snowy weather, it not only keeps the leather soft, but also makes it waterproof, and besides, does not prevent a polish being produced on the boots which are treated with it.

Harness Dressing.

The United States Government harness dressing is made as follows: Take of neatsfoot oil, 1 gallon; bayberry tallow, 2 pounds; beeswax, 2 pounds; beef tallow, 2 pounds. Put these in a pan over a moderate fire, and when thoroughly melted add two quarts castor oil, and then stir in one ounce of lampblack. Mix well and strain through a cloth to remove any sediment, and allow to cool, and you have as fine a dressing for harness or leather of any kind as can be had. A good oil for farm and team harness can be made by melting 3 pounds of beef tallow—this should not be heated sufficiently to cause it to boil—and then pouring in gradually one pound of neatsfoot oil and stirring continually till it is cold. For colour a small quantity of lampblack may be added. If this grease be carefully prepared it will be soft and smooth, otherwise it may be more or less granulated.

Blackboards.

An excellent coating for blackboards is made in this way: Dissolve eight ounces of copal in one pound of ether, and compound this with a solution of two pounds of shellac and one pound of sandarac in three and a half quarts of 90 per cent. alcohol, and further with five ounces of ultramarine, one ounce of Venice turpentine, and two pounds of fine emery. This mixture is applied with a brush to the board, and the coating, while moist, ignited. As soon as the flame is extinguished, a second coat is laid on, which is not ignited, but allowed to dry. The board is then rubbed with fine sandpaper and when cold, washed. The board has a smooth surface and can be written on with a slate pencil, and the writing washed off with a sponge. A simple process, which, however, does not give such good results, is to paint the board with ordinary black paint such as will dry with a gloss; then apply a coat of black paint, mixed with turpentine, instead of oil, which will dry a dead black. When a plastered wall is to be used for the blackboard, the following paint may be used: The ingredients required are ten ounces pulverized and sifted pumice stone, six ounces pounded rottenstone, ¾ pound good lampblack, 14 ounces shellac, and one gallon of alcohol. Mix the pumice, rottenstone and lampblack with enough alcohol to form a thick paste, which must be well rubbed and ground. Then dissolve the shellac in the remainder of the alcohol by digestion and agitation, and mix this varnish and paste together. Before the paint is put on, the wall is

prepared by giving it a coat of glue size—1 lb. of glue in a gallon of water with enough lampblack to colour. This is put on hot. When thoroughly dry apply the paint with a brush, taking care to keep the paint well stirred, so that the pumice will not settle. Two coats are usually necessary. The first should be allowed to dry thoroughly before the second is put on, the latter being applied so as not to disturb or rub off any portion of the first. The quantities mentioned of the various ingredients make one gallon of the paint, which will ordinarily furnish two coats for 60 square yards of blackboard.

Dry Batteries.

There are no really dry cells, that is, cells containing only dry powders. The so-called dry cells are usually Leclanche in type. They are made with a rod or strip of zinc, and a plate or cylinder of carbon. These are immersed in a paste composed ot a saturated solution of sal ammoniac in water, into which plaster of Paris, gelatine or some other substance is stirred till the liquid is held so that it will not run out if the cell is upset. In a sense, therefore, it is dry. The cost depends on size, materials and make-up. A very good filling for these so-called dry batteries is made as follows : Take of charcoal 3 parts ; mineral carbon, or graphite, 1 part; peroxide of mangenese, 3 parts ; lime hydrate, 1 part ; white arsenic (oxide), 1 part, and a mixture of glucose and dextrine, or starch, 1 part ; all by weight. These are intimately mixed dry, and then worked into a paste of proper consistency with a solution composed of equal parts of a saturated solution of chloride of ammonium and chloride of sodium in water, to which is added one-tenth volume of a solution of bichloride of mercury and an equal volume of hydrochloric acid. The fluid is added gradually and the mass well worked up.

Home-Made Daniell Cell.

A home-made Daniell cell is made as follows : Take a small round earthenware jar ; line the bottom with gutta-percha, or some suitable cement to the depth of a quarter of an inch ; fix upright in this a zinc rod, of equal height with the jar, to which a length of copper wire has been joined by passing it through a hole drilled in the upper part of the zinc rod. Make a cylinder of some porous clay, larger than the zinc rod, and having dried this, heat it gradually to a red heat. Let it cool gently, and when cold place it around the rod with the rod as centre. By moderately heating the end of the cylinder it will, when placed on the gutta percha, make a groove which will fix the tube and prevent infiltration of the fluids. Line the inside of the jar with a plate of thin copper bent into cylindrical form and having a few holes punched in it, through which may be threaded the extremity of another length of copper

wire. On top of this cylinder place a flat ring of copper pierced with holes, and nearly, but not quite, touching the porous cylinder. This forms the battery. To charge it, pour a saturated solution of sulphate of copper between the copper and the clay tube, and place some crystals of the same salt upon the perforated ring so as just to be in contact with the solution. Fill the zinc compartment with a solution of sulphate of zinc, sal ammoniac, or common salt.

To Fill Cracks in Floors.

A cement for filling cracks or flaws in floors is made in this way: Put any quantity of fine sawdust of the same kind of wood as the floor into an earthen pan and pour boiling water on it; stir it well and let it remain for a week or ten days, occasionally stirring it. Then boil it for some time, and it will be of the consistency of pulp or paste. After it has been boiled sufficiently, put it into a coarse cloth and squeeze all the moisture from it, and keep for use. When wanted mix some of it with a sufficient quantity of thin glue to make it into a paste, and rub well into the cracks. When quite hard and dry clean the work off; if carefully done and the floor is new, you will scarcely discern the imperfections. Another filling is made by thoroughly soaking newspapers in paste made of one pound of flour, three quarts of water and a tablespoonful of alum, thoroughly boiled and mixed. Make the final mixture about as thick as putty and it will harden like papier mache.

Razor Paste.

A paste for razor strops may be made by mixing oxide of iron (jewellers' rouge) with olive oil. The paste may also be made as follows: Levigated oxide of tin (prepared putty powder), 1 oz.; powdered oxalic acid, ¼ oz.; powdered gum, 20 grains; make into a stiff paste with water, and evenly and thinly spread it over the strop. The efficiency of the paste is increased by moistening it. Another recipe for razor strop paste is the following: Emery reduced to an impalpable powder, 2 parts; spermaceti ointment, 1 part; mix together and rub over the strop.

Squeaky Boots.

The cause of the creak of a boot is as follows: Every sole of a boot is composed of two separate pieces of leather. In walking, these two pieces of leather, in spite of their being sewed firmly together, often rub against each other, and hence the noise. But a boot does not always creak at the sole. It may come from the heel, and then it is caused by what is known as the "stiffener," or the material which is put in to make the leather which covers the heel stiff, becoming loose and moving about. The second sole must be taken off, and some soft material, like felt, placed between the two

soles, and thenceforth the boots will be noiseless. If it is the heel that is at fault, the "stiffener" must be securely sewn in, and some French chalk may be put in between it and the leather, thereby lessening the friction by which the noise is caused. Sometimes standing the soles of a pair of creaking boots in oil for twenty-four hours will have the desired effect, but this remedy is not always successful.

Bluing Gun Barrels.

The bluing of gun barrels is best effected by heating evenly in a muffle until the desired colour is raised, the barrel being first made clean and bright with emery cloth, leaving no marks or grease or dirt upon the metal when the bluing takes place, and then allowing it to cool in the air. It requires considerable experience to obtain an even, clear blue. For bluing gun barrels by staining, dissolve 4½ ozs. hyposulphite of soda in one quart of water, also ¼ oz. acetate of lead in a quart of water. Mix the two solutions and bring to a boil in a porcelain dish or stone pot. Clean the gun barrel free from grease, oil or varnish, warm it, and smear with the hot solution, using a piece of sponge tied to a stick. When the colour develops wash and wipe dry. Finish with boiled linseed oil. Another method is as follows: Polish and cleanse the barrel thoroughly with lime, and then brush it over with the following mixture: Butter of antimony, 8 parts; fuming nitric acid, 8 parts; muriatic acid, 6 parts. Add the muriatic acid slowly, drop by drop, to avoid too strong heating. Apply the mixture to the barrel with a rag and rub it with young green oak wood till the desired colour is obtained.

Sticky Fly Paper.

Sticky fly paper is made by coating stout writing paper with one of the following mixtures: (1) To 1 pint of resin add 2 fluid drachms of linseed oil. Dissolve by the aid of gentle heat, and while warm spread on the paper. (2) Resin, 9 parts; rapeseed oil, 4 parts. (3) Resin, 8 parts; turpentine, 4 parts; rapeseed oil, 4 parts; honey, ½ part. (4) Resin, 1 lb.; molasses, 3½ ozs.; linseed oil, 2½ ozs. Boil until thick enough.

To Purify Rancid Lard.

The following method is recommended for purifying rancid fat. Heat to the boiling point ten pounds of the fat to be purified, one gallon of water, and one ounce of sulphuric acid; let the mixture boil for a quarter of an hour and then remove it from the fire. Now add 4½ ounces of pulverized chalk and let the mixture cool. The purified fat separates from the water and the excess of lime, and the small quantity of moisture remaining in the fat can be removed by heating.

Black for Gun Sights.

A black composition for gun sights is made by mixing one drachm of fine lampblack, half a fluid ounce of methylated alcohol, and a half a fluid ounce of spirit varnish.

Gloss for Linen.

A beautiful gloss and superior stiffness may be imparted to cuffs, collars and shirt bosoms by putting them through a pretty stiff, well-boiled starch and drying them, after which they should be dampened with the following solution: One ounce of fine raw starch, one-quarter ounce of gum arabic, one pint of water; heat the water to dissolve the gum arabic, let it cool and stir in the starch and add the white of one egg; beat the whole well together before using. Apply lightly with a sponge, and use a polishing iron, properly to develop the gloss.

To Polish and Mount Horns.

To polish horns, first scrape them with glass to take off any roughness, then rub them well with a piece of cloth wetted and dipped in powdered pumice stone, until a smooth surface is obtained. Next polish with rottenstone and linseed oil, and finish with dry flour and a piece of clean linen rag. The more rubbing with rottenstone and oil the better the polish. To mount a pair of horns, take a block of wood long enough to extend into the horns, leaving them the original distance apart, fill the horns with wet plaster of Paris, and push them on the ends of the block. When dry they will be quite solid and may be covered with plush or velvet. The block may be rounded at the top and flattened at the bottom, so as to set securely on a shelf or bracket.

Resin for Violin Bows.

Resin for violin bows may be made as follows: Boil down Venice turpentine with a little water, until a drop cooled on a piece of glass is of proper consistency. During the boiling cold water must be added from time to time. When sufficiently thick, pour into cold water, knead well, and when cold break into pieces. Expose the pieces to the sun until they are dry, and transparent.

Frost on Windows.

Where there are double windows and the sashes fit well, there should not be much difficulty in keeping the panes free from frost. The trouble arises from the moisture condensing on the cold surface of the glass, and the way to prevent it is to keep the air spaee between the windows as dry as possible by having the inside sash tight. The moisture from the room will thus be prevented from getting in between the windows, and if the outside sash fits well the inside pains will not be cold enough to condense the moisture in the room. Storekeepers are greatly troubled in this way and the only remedy that has been found satisfactory is to put a double glass either over the whole window or extending sufficiently high to give passers-by a view of the goods displayed. A coatiug of glycerine is recommended, but this is troublesome and not always effective.

To Soften Hard Water.

Hard water may be softened by dissolving in it a mixture consisting of 2 parts of bicarbonate of soda, 4 parts of calcined soda, and 4 parts of a solution of silicate of soda. The mixture should stand for twenty-four hours when it generally becomes hard so that it can be ground to a powder. From two to three pounds of the mixture will generally soften 50 gallons of water. Water softened by this process can be used for washing clothes and for bathing, but it would not be advisable to use it for cooking or drinking.

To Stiffen a Felt Hat.

To stiffen a felt hat, mix two pounds of shellac with three ounces of salt of tartar (carbonate of potash), and two and one-half quarts of water; put these ingredients together in a kettle and boil gradually till the liquid becomes as clear as water, allow it to cool, and skim off the thin crust which forms on the surface, then dip in the hat so as to absorb as much liquid as possible; or it may be applied with a brush or sponge. The hat being thus stiffened, may stand until it has become dry or nearly so, then brush, and immerse it in very diluted sulphuric or acetic acid, in order to neutralize the potash, and cause the shellac to set.

Bottle Sealing Wax.

To make bottle sealing-wax, melt together white pitch, two parts; yellow wax, four parts; pine resin, four parts, and turpentine, two parts, Or: Pine resin, ten parts; yellow wax, two parts; and turpentine, two parts. The mixture is coloured red with two parts of red ochre; green, with one part of Berlin blue and one part of zinc chromate; blue, with two parts of ultra marine.

Axle Grease.

What is known as English carriage grease is prepared as follows: Melt in an open, capacious iron boiler over a moderate fire one part of red transparent resin and one of rendered tallow. When the melting is complete add gradually and with constant stirring one part of caustic soda lye. When the mixture ceases to rise add one part of linseed oil; let the whole boil for a quarter of an hour, strain while boiling hot through a cotton cloth into a clean vessel, and let it cool. This will give a nice, lemon-coloured buttery grease which will not gum. A thick oil grease for use in winter is made by melting together 35 parts tallow, 10 parts oil of resin, and 65 parts olive or rape oil. For use in summer the quantities are changed to 60 parts tallow, 8 parts oil of resin, and 40 olive or rape oil. A grease suitable for heavy wagons is made by melting together at a moderate heat ten parts of dark mineral wax and two to four of heavy petroleum.

Papier Maché.

Papier maché is to be obtained from old paper and the like by making it into a pulp with milk of lime or lime water and a little gum dextrin, starch or glue size. This pulp is then pressed into form, coated with linseed oil, baked at a high temperature, and finally varnished. The pulp is sometimes mixed with kaolin, chalk, etc.; and other kinds are made of a paste of pulp and recently slaked lime. The papier mache trays, boxes, etc., are prepared by pasting or gluing sheets of paper together and submitting them to powerful pressure, by which the composition acquires, when dry, the hardness of board. Such articles are afterwards japanned, and are then perfectly waterproof. Another kind of papier mache is prepared by stirring either wheat, oat, rye, barley or bean flour into a thick paste with linseed oil varnish. The mass is then pressed in moulds or rolled out in plates and dried in the usual manner. The articles when dry are saturated with linseed oil, then treated with coloured lacquers and finally polished.

To Fix Crayon Portraits.

To prevent a crayon portrait getting rubbed or blurred, it is given a coating of any of the fixatives specially prepared for this purpose, and sold by dealers in artists' materials. Very thin collodion may be used, or water starch prepared in the manner of the laundress, and of such a strength as to form a jelly when cold. This is applied with a broad camel's hair brush, as in varnishing. A thin solution of isinglass in water is sometimes used. Another method is to boil two tablespoonfuls of rice in a pint or a pint and a half of water, strain, and pass the crayon portrait through the liquid.

Leather Board.

Leather board is manufactured from leather scraps. These are first steeped in weak lime water, and then ground fine in an ordinary rag-engine as used by paper makers. The leather is next mixed with about half of good manila rope, coloured with Venetian red, and is then ready to be made into leather board, shoe shanks, heels, or stiffenings for heels and toes. The boards are made on an ordinary cylinder board machine, and can be made of almost any desired thickness. The shoe shanks are stamped to the proper shape and size on two machines and then dried. The stiffenings and toes are cut by a machine from the leather board, and then turned and formed to shape and size by another machine, and dried.

Incandescent Light Mantle.

The "mantle" of the now very common incandescent light, is an ash consisting mainly of the oxides of certain rare metals—lanthanum, yttrium, zircouium, etc., which are rendered incandescent by heating to a high temperature. A six-cord cotton thread is woven on a knitting machine into a tube of knitted fabric of a rather open mesh. This web has the grease and dirt thoroughly washed out of it, is dried and is cut into lengths double, that required for a single mantle. It is then saturated in a solution containing the requisite oxides, wrung out, stretched over spools and dried. Next, the double-length pieces are cut into two, the top of each piece is doubled back and sewed with a platinum wire, which draws the top in and provides a means of supporting the mantle, when finished, from the wire holder. After stretching the mantle over a form, smoothing it down and fastening the platinum wire to the wire mantle holder, the mantle is burned out by touching a Bunsen burner to the top. The cotton burns off slowly, leaving a skeleton mantle of metallic oxides, which preserves the exact shape and detail of every cotton fibre. The soft oxides are then hardened in a Bunsen flame. A stronger mantle is made upon lace-making machinery.

To Wash Flannels without Shrinking.

Flannels should always be washed with white soap, otherwise they will neither look well nor feel soft. The water must be warm, but not boiling, as it shrinks flannel to scald it. Wash the flannels entirely by themselves in clean, warm suds made by rubbing the soap to a strong lather in the water before putting in the flannels, for if the soap is rubbed on flannel it will become hard and stiff. Wash the garments in this manner through two waters. Rinse in warm water to which bluing has been added. Cold rinsing water hardens the flannel. After rinsing thoroughly, wring hard, shake well, and spread on the clothes-line. While drying, shake, stretch,

and turn the articles several times. They should dry slowly. Flannel garments always washed in this manner will look white and feel soft as long as they last, retaining a new appearance, and scarcely shrinking at all. But if once badly washed with scalding water, rubbed with brown soap, and rinsed in cold water, they will never look well.

Bird Lime.

To prepare bird lime boil the middle bark of the holly, gathered in June or July, for 6 or 8 hours in water, until it becomes tender ; then drain off the water, and place it in a pit under the ground, in layers with fern, and surround it with stones. Leave it to ferment for two or three weeks, until it forms a sort of mucilage, which must be pounded in a mortar into a mass and well rubbed between the hands, in running water, until all the refuse in worked out ; then place it in an earthen vessel, and leave it for four or five days to ferment and purify itself. Bird lime may also be made from mistletoeberries, the bark of the wayfaring tree and other vegetables, by a similar process. Should any of it stick to the hands, it may be removed by means of a little kerosene oil or turpentine. Another preparation is made by heating linseed oil until it emits an inflammable vapour or by boiling down printer's varnish until tough and sticky ; or use a solution of cabinetmaker's glue in water, with addition of strong chloride of zinc solution.

Transparent Cement for Glass.

Canada Balsam makes a good transparent cement for glass. It is used by opticians to cement their lenses together and is perfectly transparent.

Cement for Lamps.

A cement adapted for attaching the brass work to oil lamps is made by boiling 3 parts resin with 1 part caustic soda and 5 parts water. The composition is then mixed with half its weight of plaster of Paris. It sets firmly in half to three-quarters of an hour. It is of great adhesive power, not permeable to petroleum, a low conductor of heat, and but superficially attacked by hot water. Zinc white, white lead, or precipitated chalk may be used instead of plaster of Paris, but they harden more slowly.

Cement of Pompeii.

The following formula is given for making the well-known cement of Pompeii, or universal cement : Dissolve eight ounces of sugar in twenty-four ounces of water, in a glass flask on a water bath, and to the thin syrup add two ounces of slaked lime ; keep the mixture at a temperature of about 70 to 75 degrees centigrade (158 to 167 Fahr.), for three days, shaking frequently ; then cool and decant the clear liquid. Dilute six and a half ounces of this

liquor with as much water, and in the mixture steep sixteen ounces of fine gelatine for three hours, after heating to effect solution. Finally, add to the mixture an ounce and a half of glacial acetic acid and fifteen grains of pure carbolic acid. One of the strongest and most easily prepared cements for mending China is lime and white of an egg. To use it, take a sufficient quantity of the white of egg to mend one article at a time, shape off a quantity of lime and mix thoroughly. Apply quickly to the edges and place firmly together, when the article will soon become set and strong. Mix but a small quantity at a time, as it hardens very soon, so that it cannot be used. Calcined plaster of Paris answers as well as lime.

Cement for Marble.

A very good cement for marble is made as follows : Soak some plaster of Paris in a saturated solution of alum, dry it, and then bake it in the oven in the same way as gypsum is baked to make it plaster of Paris ; after which grind it to the powder. It is then used as wanted, being mixed with water like plaster and applied. It sets into a very hard composition, capable of taking a very high polish, and may be mixed with various colouring minerals to produce a cement of any colour capable of imitating marble.

Cement for Leather.

An excellent cement for leather is made by mixing ten parts of bisulphide of carbon and one of turpentine, and dissolving in the mixture a sufficient quantity of gutta percha to form a paste. The pieces of leather to be joined are cleansed from oil and grease, by laying a rag upon their surfaces, and placing a hot iron upon it. Both pieces of leather are then spread with the cement, and subjected to pressure until the cement has become dry. The following is another recipe ; Put equal parts of common glue and American isinglass in a boiler, with sufficient water to cover them. Let them soak for ten hours, then bring the whole to a boiling heat, and add pure tannin until the mixture becomes ropy, or appears like the white of eggs. Apply it warm. Buff the grain off the leather where it is to be cemented, rub the jolned surfaces solidly together, let it dry a few hours, and it will be ready for use.

Rubber Cement.

The following is an excellent cement for repairing rubber boots and shoes, waterproof coats, etc. : Prepare two solutions, the first consisting of ten parts of pure virgin caoutchouc dissolved in 280 parts of chloroform, and the second of ten parts of caoutchouc, four of rosin, and two parts of gum turpentine dissolved in 40 parts of oil of turpentine. The first solution is prepared by allowing the caoutchouc to dissolve in the chloroform. For the second solution

the caoutchouc is cut into small pieces and melted with the rosin. The gum turpentine is then added and the mass is finally dissolved in the oil of turpentine. Both solutions are then mixed together. To repair a hole in a rubber shoe or waterproof garment, the place to be repaired is brushed over with the cement, and a piece of close linen dipped in the cement, then laid over it. As soon as the linen adheres the cement is applied and smoothed. With some skill the hole may be repaired so that it cannot be detected.

Cloth Cement.

A good cement for cloth is made as follows: Cut up into small pieces 16 parts gutta percha and 4 parts pure caoutchouc. Add two parts pitch well broken up, one part shellac, and two parts linseed oil. Melt all together and mix well. For fastening cloth to iron rolls there is nothing better than ordinary glue to which tannin has been added until the glue becomes ropy.

Cement for Stoves.

A good cement for closing cracks in stoves is made as follows: Mix very fine iron filings with liquid water glass to a thick paste, and coat the cracks with this. The hotter the fire then becomes the more does the cement melt and its ingredients combine together, aud the more completely will the crack become closed. Another preparation used for the same purpose as the above is made as follows: Take equal parts of sulphur and white lead, with about a sixth part of borax, and incorporate them so as to form a homogeneous mass. When about to apply this cement, wet the mixture with strong sulphuric acid, and place a thin layer of it between the two surfaces, and press them well together. Still another cement is made by mixing together the following: Sand, six parts; iron filings, five parts; bone black, five parts; slacked lime, six parts; glue water, sufficient to make a paste.

Glue.

Glue should be made in a regular glue-pot, which consists of two iron vessels, one within the other; the glue, previously softened by soaking in cold water, is placed in the inner vessel with sufficient water to dissolve it, while the outer vessel is about half or three-quarters filled with water. When this arrangement is used, it is impossible for the glue to get scorched or burned, as it is apt to do when a single pot only is used. Glue loses much of its strength by frequent re-melting; therefore glue which is newly made is preferable to that which has been reboiled. The hotter the glue the more force it will exert in keeping the jointed parts glued together. In all large and long joints it should be applied immediately after boiling. Good glue should be a light brown colour, semi-transparent, and free from waves or cloudy lines.

Waterproof Glue.

A good waterproof glue may be made in the following manner: Take powdered slaked lime, 40 parts; white of egg, 50 parts, and powdered alum, 10 parts; all by weight. Triturate well the whole, so as to form a rather homogeneous paste; apply same to the parts to be glued and keep them squeezed together for forty-eight hours either by means of cords, presses or merely by driving nails into the wood upon which the glued piece is lying.

Liquid Glue.

A liquid glue may be made by boiling together for several hours 100 parts glue, 260 parts water, and 16 parts nitric acid. Another recipe is the following: Pour eight quarts of water over three of glue, cut in small pieces and let it stand for a few hours. Then add half a part of hydrochloric acid and three-quarters of a part of sulphate of zinc, and expose the mixture to a temperature of 175 to 190 degrees Fahr., for ten or twelve minutes, and if necessary it can be clarified by allowing it to settle and then filtering. A liquid glue possessing great resisting power recommended for wood or iron is made as follows: Clear gelatine, 100 parts; cabinetmakers' glue, 100 parts; alcohol, 25 parts; alum, 2 parts; the whole mixed with 200 parts of twenty per cent. acetic acid, and heated on a warm bath for six hours.

Mucilage.

The best quality of mucilage on the market is made by dissolving clear glue in equal volumes of water and strong vinegar and adding one fourth of an equal volume of alcohol, and a small quantity of a solution of alum in water. Some of the preparations offered for sale are merely boiled starch or flour mixed with a very little nitric acid to prevent gelatinization.

Library Paste.

A very good paste for use in the library is made of one ounce rice starch, three drachms gelatine, and half a pint of water. Heat with constant stirring until the milky liquid becomes thick and glassy, when the paste is ready. Keep in a tight bottle with a few drops of oil of cloves.

Paste for Mounting Photographs.

A good paste for mounting photographs is made as follows: Take of cooking gelatine, 1 ounce; alcohol, 10 ounces; glycerine, ½ to 1 ounce. Soak the gelatine in cold water for an hour or more; take out and drain off all the water possible, and place in a wide-mouthed bottle with the alcohol. Add half an ounce to one ounce of glycerine according as the gelatine is hard or soft, and

put the bottle in hot water, with occasional shaking, until the gelatine is all dissolved. This paste will keep indefinitely in a well-corked bottle or covered jar, and has only to be heated up when wanted for use. It is applied rapidly, and as thinly as possible with a broad bristle (varnish) brush.

To Fix Paper to Wood.

Ordinary mucilage made from gum arabic does uot fix paper to wood or pasteboard. This disadvantage may be overcome by adding sulphate of alumina, dissolved in ten times its quantity of water. Ten grains of sulphate of alumina are sufficient for 250 grains of mucilage. Moreover, mucilage prepared in this way will not become mouldy.

Sticking Labels on Tin.

A good way to stick labels to a tinned plate is as follows: Dissolve some isinglass in acetic acid, and brush the labels over with it. Take a wide-mouthed bottle, fill about two-thirds with commercial acetic acid, put in as much isinglass as the liquid will hold, and set aside in a warm place until completely dissolved. When cold this should form a jelly. To use it place the bottle in hot water. The cork should be well-fitting, and smeared with vaseline or malted paraffine.

Staining a Floor.

A very satisfactory staining material is a weak solution of permanganate of potash. This, when first applied, produces a wine colour, but on exposure to the air, quickly oxidizes, becoming a rich oak shade. In preparing the stain the permanganate of potash should be dissolved in water and diluted, and a little of it applied with a brush to a piece of smooth board of the same material as the floor; this should be allowed to stand exposed to the air for half an hour; if the colour is too dark the stain must be further diluted with water until the desired shade is produced. The floor should be made very clean and dry, soiled places being sand-papered. One application of the stain should be given, and when thoroughly dry, one or two coats of good varnish should be put on. This will protect the stain, leaving a beautiful surface in which the natural grain of the wood may be seen.

Violin Stain.

A good cherry stain for violins is made by boiling 4 ounces of annato in three quarts of water in a copper kettle till the annato is dissolved, then put in a piece of potash the size of a walnut, keep on a fire for half an hour longer and then it is ready for use or to be bottled. If a rosewood stain is desired, take 1 gallon of alcohol; 2 ozs. of cam wood; set them in a warm place for twenty-four

hours ; then add 3 ounces of extract of logwood and 1 ounce of aquafortis ; when complete solution has taken place the stain is ready for use. It is well to remember that better results are obtained by applying several coats than by the application of a single dark coat.

Stain for Brick.

For staining bricks red melt one ounce of glue in 1 gallon of water; add a piece of alum the size of a hen's egg, then ½ lb. Venetian red and 1 lb. of Spanish brown. Try the colour before using and change light or dark with red or brown. Use a yellow mineral for buff.

Mahogany Stain.

A good serviceable mahogany stain may be made as follows: Boil ½ lb. madder and 2 ozs. logwoood chips in 1 gallon of water, and apply while hot. When dry go over with a solution of 2 drachms pearl ash to 1 quart of water. The colour can be varied by using different strengths of the solutions.

Oak Stain.

An oak stain may be made by mixing powdered ocher, Venetian red and umber in size, in proportions to suit; or a richer stain may be made with raw sienna, burnt sienna and vandyke. A light yellow stain of raw sienna alone is very effective.

Black Stain for Wood.

A good black stain for wood is made as follows: Boil 1 ounce logwood extract powder in 3¼ pints of water ; when the extract is dissolved add 1 drm. yellow potash chromate (not the bichromate), and agitate the whole. The operation is now finished and the liquid will serve equally to write with or to stain wood. Its colour is a very fine dark purple which becomes black when applied to wood. 2. To imitate the black of ebony, first, wet the wood with a solution of logwood and copperas, boiled together and applied hot. For this purpose 2 ounces of logwood chips with 1½ ounces of copperas to 1 quart of water, will be required. When the work has become dry, wet the surface again with a mixture made by dissolving 2 ounces of steel filings in ½ pint of vinegar. When the work has become quite dry again, sandpaper down till quite smooth. Then oil and fill in with powdered drop black mixed in the filler. A good filler consists of boiled oil and enough corn starch to make a very thick paste. Apply with brush and rags. Let it dry for 48 hours, and then sandpaper with No. 0 paper. Add a second coat, using less oil. This method does not apply to rosewood, and should not be attempted on that material. Work to be ebonized should be smooth, free from holes, etc. The

work may receive a light coat of quick drying varnish, and then be rubbed with finely-pulverized pumice and linseed oil until very smooth.

To Darken Oak.

Oak may be darkened by using liquid ammonia, which may be bought from any wholesale chemist. The wood to be darkened should be placed in a dark and airtight room and half a pint or so of the ammonia poured into a soup plate and placed on the floor in the centre of the room. This done, shut the entrance and secure any cracks by pasting over them strips of paper. Remember that the ammonia does not touch the oak, but the gas that comes from it acts upon the tannic acid in the wood and browns it so deep that a shaving or two may actually be taken off without removing the colour. The depth of shade will depend entirely upon the quantity of ammonia used and the time the wood is exposed.

Oak Graining.

The principle of graining is that a ground colour is laid on nearly the same tint as the lightest parts of the wood to be imitated. On this when dry is laid a thin coating of a transparent colour, which is to be treated with a resemblance to the grain of the wood to be imitated. After this is dry the darker parts are put in with a small brush, or pencil, in such places and in such quantities as are deemed advisable. The whole, when dry, is then varnished once or twice. Oak graining is done in oil as follows: For the ground coat, rottenstone and white lead, mixed with oil to a tint similar to the lightest parts of oak, is used. On this is laid a thin coat of the "megilp," or graining colour, which is a mixture of rottenstone, sugar of lead, and wax, mixed not with oil, but either with very thin gum water, stale beer, or vinegar containing a small portion of dissolved fish glue. In a few minutes the graining comb is drawn along the wet surface in a waving line, by which an effect is produced similar to the grain of the wood. A piece of leather is now wrapped round the end of the finger, or of a stick, and with it the paint is wiped off in patches, spots or lines, in imitation of the light spots seen in oak. To remove the appearance of hardness the blender, a soft brush used dry, is

daubed over it, by which a softening effect is produced. When the graining colour is dry, the dark veins are imitated by putting on a little vandyke brown, ground in stale beer. When the whole is dry apply a coat of transparent varnish. To imitate oak in distemper, use the same ground as for oil and apply with a brush the graining colour composed of raw and burned umber and vandyke brown, ground in stale beer. The graining is effected with tools made on purpose called "veining brushes." The light and dark patches, veins, etc., are produced in much the same way as in the former instance. As with oil graining, it is varnished when dry.

To Remove Stains from Textiles.

In order to remove paint, varnish and resin stains from white or coloured cotton and woollen goods, first soften the paint or varnish with turpentine or benzine, then wash in soapsuds. To remove such stains from silk use benzine or ether, followed by soap.

To Remove Paint from Wood.

The easiest way to remove paint from wood is to burn it with a lamp specially constructed for the purpose; this softens the paint to such a degree that it is then easily scraped off with a painter's flat-ended knife. If such a lamp cannot be had, the paint may be removed by applying strong soda lye, and after leaving it for some time scraping it off as before. If the wood is to be repainted, it is necessary to go over it first with vinegar or weak acid to "kill" or neutralize the soda which would prevent the paint from adhering.

Removing Paint from Glass.

Paint may be removed from glass by using a mixture composed of three parts of caustic potash, and one part unslaked lime. Apply this to the glass, letting it remain for some time, and it will remove either paint or tar.

To Clean White Paint.

White paint is cool and clean and fresh-looking, but it has its disadvantages. One of them is that it must be constantly looked after, as it shows up every spot and speck. To clean paint that has become dirty, procure a basin of warm water, a saucerful of whitening, and a flannel. Dip the flannel in the water, squeeze it nearly dry, take up as much whitening as will adhere to it, and apply to the painted surface. Very gentle rubbing will remove any grease or dirt. Rinse over with clean water, and dry with a soft chamois leather, paint cleaned in this way will look as well as the first day it was laid on. White stains show up black in the

crevices in a most annoying manner if not dusted very carefully. A little whiteuing dipped on a rag and rubbed over, after all possible dust has been got rid of, remedies this defect.

To Clean Wall Paper.

The paper o. a room, if not very dirty, may be much improved by brushing it over in straight lines with a soft broom, covered with a clean soft cloth. If, however, the paper is much soiled, very stale bread is the best thing to clean it with. Cut a very stale quartern loaf into slices, and in the lightest manner possible, wipe the paper with it in a downward direction. Clean about a yard at a time, all one way, and be careful to leave no marks. By this process very dirty paper-hangings may be made to look almost like new.

To Clean Gilt Picture Frames.

Fly marks can be cleaned off gilt picture frames with soap and water used sparingly with a piece of soft rag, covering the end of the finger. When all cleared off, rinse with cold water and dry with chamois leather, but take care that you do not use too much water or rub too hard. Next melt a small quantity of common glue size by heating in a pan with just enough water to cover it, and strain through muslin. Apply this thinly to the frames with a camel's hair brush, the kind that is known technically as a "dabber." On no account use gold size, as it is used only in regilding, and if put on over the gold would make it dull and sticky.

To Clean Sponges.

Sponges that have become slimy are often cleaned by soaking them in a strong solution of washing soda, but this is not a good plan as it has a deleterious effect on the fibre of the sponge The best plan is to use a mixture of two tablespoonfuls of sulphuric acid (oil of vitriol) to a pint of water. Steep the sponge in this for a couple of hours, then knead it thoroughly, keeping it still in the liquid, after which wash it well in clean water.

To Purify Feathers.

To purify feathers for beds, pillows, etc., prepare a quantity of lime water in the following manner: Mix well one pound of quicklime in each gallon of water required, and let it stand until all the undissolved lime is precipitated, as a fine powder, to the bottom of the pan or tub; then pour off the liquor for use. The number of gallons to be prepared will depend, of course, on the quantity of feathers to be cleaned. Put the feathers into a clean tub, pour the lime water on them, and stir them well until they all sink to the bottom. There should be sufficient of the lime water

to cover them to a depth of three inches. Let them stand in this for three or four days; then take them out, drain in a sieve, and afterwards well wash and rinse them in clean water. Dry the feathers on nets having meshes about the same size as cabbage nets; shake the nets occasionally, and the dry feathers will fall through. When they are dry beat them well to get rid of the dust. It will take about three weeks to clean and dry a sufficient quantity of feathers for a bed.

To Remove Grease Spots from Books.

Grease spots, no matter how old, may be removed from books by applying a hot solution of caustic potash of varying strength from three to five per cent., according to the age of the stain. To do this saturate a piece of thick blotting paper with the solution and apply it to the back of the leaf. Place two or three leaves of blotting paper on the front, turn the whole over on a narrow board, and with a hot iron go over the stain. If the first application does not remove the stain, repeat the operation. As the grease is removed dip another sheet of blotting paper in water acidulated with four or five per cent. of hydrochloric acid, apply it to the back of the leaf in the same manner as before and iron until the paper is dry. This restores the faded printing and makes the paper bright and fresh. With fresh stains, blotting paper saturated with carbon bisulphide, benzine, benzol, ether, chloroform, or even rectified oil of turpentine, will answer. Wax yields to the same treatment, provided all surplus wax be first scraped off the surface.

To Remove Inkstains from Paper.

Ink stains may sometimes be removed from paper by means of a strong solution of oxalic acid, but certain kinds of ink are hardly affected by it. A better and more certain method of removing them is the following: Put one ounce of chloride of lime (bleaching powder) in half a pint of water, shake thoroughly, and allow the mixture to stand for twenty-four hours to dissolve the lime. Then strain through a cotton cloth and add a wine-glassful of commercial acetic acid. This is applied with a pointed stick or camel's hair pencil without rubbing, to whatever it is desired to erase. When the ink has disappeared absorb the fluid with blotting paper; apply clean water, and again absorb with blotting paper.

To Remove Inkstains from Linen Goods.

To remove ink stains from linen goods take equal parts of cream of tartar and citric acid, powdered fine, and mix well together. This forms the salts of lemon which is sold by druggists. Then procure a hot dinner plate, lay the stained part in the

plate, and moisten with hot water. Next rub in the above powder with the bowl of a spoon until the stains disappear ; then rinse in clean water and dry. Or place the stained part flat in a dish, and sprinkle crystals of oxalic acid upon it, adding a little water. The stains will soon disappear, when the linen should be wrung out in two or three changes of clean water.

To Clean Buckskin.

To clean buckskin use a weak solution of washing soda in warm water. Rub plenty of soft soap into the leather, and allow it to soak in the soda solution for two hours, then rub it sufficiently and rinse in a weak solution of warm water, soda, and yellow soap. It must not be washed in pure water or it will become very hard when dry. It is the small quantity of soap remaining in the leather which penetrates its smallest particles and makes it soft and pliable. After rinsing, wring out in a coarse towel and dry quickly, then pull it in every direction and brush well.

To Clean Sea Shells.

Dark coloured organic matter on the outer surface of sea shells is first removed by making a thick mixture of one part bleaching powder to two parts of water and soaking the shell therein. On removing, wash and scrub it. Thick incrustations of lime must be picked off with a sharp-edged hammer or some similar tool, and then the shell must be dipped in boiling diluted hydrochloric acid. Valuable shells may have the face or pearly portion covered with shellac varnish, which may be removed with alcohol after the acid bath. For strong, heavy shells use one part of acid to ten of water. Dip the shell for a second only, wash and examine ; if not enough, give it a second dip. Hold it in wooden forceps, or attach it to a stick in any way to serve as its handle. The important point is not to let the acid stay long on the shell. For local spots it may be applied with a brush.

To Remove Mildew.

To remove mildew stains from silks or linen cut some ordinary good soap into shavings and boil into a stiff paste with pure water. Apply this to the stain, and scatter upon it some finely powdered potash. Then spread the goods in the sun and allow them to remain there for twenty-four hours. When dry sprinkle some water upon the stain and wash the fabric, when the stain will have disappeared. Wine and fruit stains may also be removed from silk or linen by this method. Another way to remove mildew stains from linen is to mix two tablespoonfuls of soft soap and the juice of a lemon, and lay it on the spot with a brush, applying it to both sides of the fabric. Let it be a day or two till the spots disappear.

To remove mildew stains from cotton goods, if they are coloured, soak for twenty-four hours or more in sour milk or buttermilk, then rinse in water and wash in strong soap suds. If the goods are white, moisten the spots repeatedly with javelle water, diluted with two volumes of water, rinse well, then wash in strong soap-suds, not too hot. A ready way to prepare the javelle water is to make a solution of half a pound of chloride of lime in three pints of water, and another solution of seven ounces of carbonate of soda crystals in a pint of water. Mix the two solutions, stir well, and draw off the clear liquid, after the mixture has settled. This preparation is excellent for removing stains from white goods.

Cleaning Firearms.

To clean firearms and keep them clean use a high grade coal oil. If the breech mechanism is stiff, soak it in the oil and then take it to pieces. Let the parts remain in a bath of coal oil over night, and then rub them with a cloth dipped in the oil and sprinkled with some finely powdered bath brick. If the inside of a rifle barrel is badly encrusted with rust, it may be necessary to have it bored, but as a general rule a liberal application of coal oil will be sufficient. When a gun is in good condition it should be cleaned by using first a soft rag soaked in coal oil, then a stiff brush soaked in the same oil, and last a piece of clean dry soft rag. Each operation should be performed about a dozen times before the next is proceeded with. The use of wire brushes for cleaning guns is objectionable as the numerous sharp points cut into the tube. The coal oil is enough to loosen all the dirt.

To Whiten Piano Keys.

The reason piano keys turn yellow is because they absorb the grease from the fingers, and to whiten them it is therefore necessary to remove this. If a paste made from whiting and solution of potash is laid on and allowed to remain for about twenty-four hours, the ivories will be restored very nearly, if not quite to their original colour, without removing them from the keys.

To Renovate Oilcloth.

To restore the polish to oilcloth that has lost its lustre proceed as follows: Wash with a soft woollen cloth and lukewarm or cold water, dry thoroughly with a soft cloth, and then polish with milk or a weak solution of beeswax in turpentine. Never use a brush, or hot water, or soap, as these tend to take off the paint. Another preparation that is sometimes used is 2½ pounds of paraffin wax, dissolved in one gallon of oil of turpentine by the aid of gentle heat. This is applied while warm with a sponge or piece of flan-

nel, and allowed to remain on the cloth for twenty-four hours, after which the oilcloth is polished with flannel. This solution not only renovates but preserves the cloth.

Removing Stains from Tan Shoes.

To remove stains from tan shoes use white castile soap, applied with a piece of moistened flannel.

To Clean Old Coins.

The following process is recommended for cleaning coins or medals of silver or bronze without impairing their numismatic value: Prepare a bath composed of nine parts of rain-water and one part of sulphuric acid. Place the coins in the bath for the time required to dissolve the sulphide which has blackened them. Five or ten minutes are usually sufficient. After removing them plunge them into clear water; next wash them with soap, using a soft brush. When they are clean move them about once more in the clear water, dry them with a soft cloth, and finally give them another treatment with chamois cloth without rubbing too hard.

To Clean Marble.

To remove stains from white marble, mix one ounce of ox-gall, one gill of lye, and one and a half teaspoonfuls of turpentine, and make into a paste with pipe-clay. Put the paste over the stain, let it remain for several days, and then rub off. Another method is as follows: Mix together a quarter of a pound of whiting, one ounce of soda, and a piece of stone blue the size of a walnut. Rub this over the marble with a piece of flannel and leave it for twenty-four hours; then wash off with clean water and polish the marble with a piece of flannel or felt. If the stains are very bad use strong lye or make a solution of three pounds of common washing soda in a gallon of hot water, and apply with a paint brush. Iron mould or ink stains may be taken out of white marble by dissolving in 1½ pints of rain water, 1½ ounces of oxalic acid, ¾ ounce of butter antimony and then adding sufficient flour to make the mixture of the consistency of paste. Apply the paste to the marble with a brush and let it remain a few days Then wash off with clean water.

To Polish Black Marble.

The following composition is recommended for polishing black marble: Gum elemi, half ounce; methylated spirit, 2 ozs.; linseed oil, 4 ozs.; turpentine, 5 ozs.; acetic acid, ½ oz.; water, 3½ ozs. Dissolve the gum in the spirit and strain; add the oil and turpentine, and finally the acid and water.

Cleaning and Polishing Brass.

There are many substances and mixtures used for cleaning and polishing brass. Oxalic acid is the best, but it must be immediately washed off and the brass dried and rubbed with sweet oil and some polishing powder, otherwise it will soon tarnish again. A very good preparation for polishing is made of one ounce of oxalic acid, two ounces rottenstone, an ounce and a half sweet oil, and turpentine enough to make a paste. When used, a little water is added and the brass is rubbed vigourously with this. Brass work that is so dirty by smoke and heat as not to be cleaned with oxalic acid, should be thoroughly washed or scrubbed with soda or potash lye. Then apply a mixture of equal parts of nitric acid, sulphuric acid, and water, with a swab made by tying a piece of cloth to the end of a stick, rubbing the solution over the dirty or smoky parts. Leave the acid on for a minute, then wash clean and polish. Care must be taken not to get any of this acid mixture on the hand or clothes as it is very corrosive.

Cleaning Tarnished Silver.

The following methods are recommended for cleaning silver that has become badly tarnished: 1. Immersion in a warm solution of one part potassium cyanide to eight parts of water. (The mixture is extremely poisonous.) Washing well with water and drying will produce a somewhat dead-white appearance, which may be quickly changed to a brilliant lustre by polishing with a soft leather and rouge. 2. A fresh concentrated solution of hyposulphite will dissolve at once the coat of sulphide of silver which is the cause of the blackness produced by mustard, eggs, etc., or anything containing sulphur. 3. Precipitated chalk, 2 ounces; ammonia water, 2 ounces; methylated spirits, 3 ounces; water to 20 ounces. 4. Precipitated chalk, 8 ounces; spirits of turpentine, 2 ounces; alcohol, 1 ounce; spirits of camphor, ½ ounce, and ammonia water, 2 drachms.

Polish for Nickel.

A good polish for nickel is make by mixing together equal parts of precipitated carbonate of iron and prepared chalk. Another preparation consists of rouge with a little fresh lard or lard oil. Apply with a wash leather or piece of buckskin. Rub the bright parts, using as little of the rouge and oil as possible, and wipe off with a clean rag slightly oiled.

Stove Polish.

The base of nearly all commercial stove polishes is graphite or black lead, reduced to an impalpable powder by grinding in a mill with water, and then drying. While wet it may be pressed

into cakes of any desired form. A paste polish may be made by mixing 5 parts of black lead, 5 parts of bone black, and 10 parts of copperas, with sufficient water to make a paste.

Polishing Mahogany.

In order to obtain a fine polish on mahogany, or for that matter on any wood, it is necessary first to fill it. A filler suitable for mahogany is made as follows: Take equal parts by weight of whiting, plaster of Paris, pumice stone, and litharge, all in fine powder, to which may be added a little French yellow, asphaltum, Vandyke brown, and sienna. Mix with one part japan, two parts boiled linseed oil, and three parts turpentine, and grind well together. Lay the filling in with a brush, rub it in well, let it set twenty minutes, and then rub it clean. The actual polishing may be done in various ways. A good plan is to apply a coat of shellac varnish, and then rub it with a piece of pumice stone till it is dry. Another coat is given, and the rubbing repeated. After this, a coat of polish, made of linseed oil, beeswax, and turpentine, is well rubbed in with a dauber, made of a piece of sponge tightly wrapped in a piece of fine flannel folded several times and moistened with the polish. If the work is not fine enough it may be smoothed with the finest sandpaper, and the rubbing repeated.

Furniture Polish.

For cleaning and polishing varnished surfaces a furniture polish composed of equal parts of raw linseed oil, turpentine and dilute acetic acid works well. Furniture dealers and makers seldom use anything but crude petroleum for furbishing up new furniture or varnished work. The acetic acid mixture works best on old work, as, aside from its detergent properties, the acetic acid has a tendency to soften up the resin of the varnish and thus cover up cracked varnish surfaces.

French Furniture Polish.

French polish is made as follows: Take one pint of rectified spirits of wine, ¼ ounce gum copal, ¼ ounce gum arabic, and one ounce shellac. Crush the gums to a fine powder and sift them through a piece of muslin. Place the gums and the spirit in a bottle or other vessel closely corked, put it near a warm stove and shake frequently. In two or three days the gums will be dissolved. Then strain through a piece of muslin and put away in a tightly-corked bottle. The polish is then ready for use.

Renovating Furniture.

When highly polished furniture assumes a bluish white appearance, or the surface is injured so as to show white marks, it should be rubbed with a mixture of equal parts of raw linseed oil

and turpentine and then wiped off clean. If this does not restore the appearance of the furniture, the only remedy is to repolish it, and though this is a somewhat difficult operation, a fairly good job may be made of it if the following directions are carefully followed. The old polish must first be removed by scrubbing it with a paste made of finest emery flour and spirits of turpentine. After cleansing and before repolishing, it is a good plan to merely moisten the face of the work with raw linseed oil, for this causes the old body to unite with the new one. Where shallow dents, scratches and broken parts of the polish present themselves, carefully coat them two or three times with a thick solution of shellac, and when the last coatings become hard, rub them with soft putty until they become uniformly smooth and even, then proceed to polish the general surface.

Polishing Hardware Floor.

After being well scraped so as to obtain a good, clean, smooth surface, the floor is given a coat of thin size, and this is allowed to dry for twenty-four hours. After this the floor is gone over with a solution of beeswax in spirits of turpentine, the proportions being about one pound of wax to two quarts of turpentine. In preparing this the wax is shredded, placed along with the turpentine in a stone bottle, and kept in a warm place with frequent shaking. When the beeswax mixture has soaked well in, the floor is polished with a rather hard brush until a good surface is obtained. Special brushes, adapted to polishing waxed floors, are sold at paint stores.

Filler for Wood.

A very good filler for hard wood is made by mixing hard boiled linseed oil with enough corn starch to make a very thick paste, adding a little japan, and reducing with turpentine. Add no colour for white oak; for dark ash and chestnut use a little raw senna; for walnut, burnt umber, and a very little Venetian red. Use enough colour to cover the white of the starch. Apply with brush and rags, allow it to dry for forty-eight hours, or until it is in condition to rub down with No. o sandpaper, without much gumming up, and if an extra fine finish is desired, fill again with the same materials, using less oil but more japan and turpentine. The second coat will not shrink, being supported by the first. When the second coat is hard, the wood is ready for finishing up in any desired style or to any degree of nicety by following the usual methods. This formula is not intended for rosewood and will not be satisfactory if used therefor. What is known as American wood filler is made as follows: Take of pulverized starch, 3 parts; heavy spar, 3 parts; drier, ½ part, all by weight. Mix with enough turpentine to make the consistency of ordinary

varnish. For dark wood add to the drier umber to ½ part. Apply with a brush and rub across the grain of the wood with a piece of felt fastened to a piece of wood. Let the wood dry about eight hours, rub with glass paper, then polish and varnish. Another mixture, known as German wood filling, is made by mixing new tallow and plaster of Paris thoroughly together, before a fire, if the weather is cold. Darken, if required, with any colouring to suit. When well rubbed in, give a coat of shellac, and French polish or varnish. Finally, we give two other recipes for fillers, which are often used: (a) Boiled linseed oil, 1 quart; turpentine, 3 quarts; corn starch, 5 pounds; japan, 1 quart; calcined magnesia, 2 ounces; mix thoroughly. (b) Whitening, 12 ounces; japan, 1 pint; boiled linseed oil, 1 pint; turpentine, 1 pint; corn starch, 2 ounces; mix well together. In both cases colouring matter is to be added if required.

Rust Preventives.

To protect metals from rusting, that is oxidation, it is necessary to exclude air and moisture from the actual metallic surface. Polished tools are usually kept in wrappings of oiled cloth and brown paper, and thus protected, they will keep free of rust for a long time. When the metals are exposed, as in the case of bridges and other structures, it becomes necessary to protect them by means of permanent dressing or paint. For this purpose the oxide of iron paint is one of the best preparations. It is made by simply grinding the red oxide of iron to a fine powder and mixing it with boiled linseed oil to the consistency of ordinary paint, when it is applied in the usual way. Another preparation is made in this way: Rub 6 ounces of graphite to a fine powder, add 4¼ ozs. of sulphate of lead, 1 oz. of sulphate of zinc, and 1 pound of linseed oil varnish; heat the whole to the boiling point and stir thoroughly. This paint can be used for all metallic articles exposed to the action of the weather. The following preparation is recommended for keeping iron and steel machinery, etc., free from rust: Dissolve half an ounce of camphor in one pound of hog's lard, take off the scum and mix as much black lead as will give the

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mixture the colour of iron. Rub the machinery over with this mixture, leave it on twenty-four hours, and then wipe off gently with a linen cloth. If the machinery is to be kept in a very damp place it should be kept thickly coated with the mixture. Boiled linseed oil acts as a sufficient preventive of rust on iron and steel. Wipe the metal with a cloth dipped in the oil, and let it dry. Vaseline will also keep the steel and iron from rusting, but the expense, of course, is an objection to its use.

To Prevent Rusting of Razors.

For the purpose of preventing rusting of small instruments the Lancet recommends a mixture of equal parts of carbolic acid and olive oil, smeared over the surface of the instruments. This is much used by medical officers in the navy, and is found to preserve the polish and brightness of the steel, however moist and warm the climate may be. For large instruments and tools, boiled linseed may be recommended. Wipe the metal with a cloth dipped in the oil, and let it dry.

Removing Rust.

The following method is recommended as being a simple yet effective way of removing the rust from iron or steel articles, no matter how badly they may be rusted: Attach a piece of ordinary zinc to the articles, and then let them lie in water to which a little sulphuric acid is added. They should be left immersed for several days or a week, until the rust has entirely disappeared, the time depending on how deeply they were rusted. If there is much rust a little sulphuric acid should be added occasionally. The essential part of the process is that the zinc must be in good electrical contact with the iron; a good way is to twist an iron wire tightly around the object and connect this with the zinc, for which a remnant of a "battery zinc" is suitable, as it has a binding post. Besides the simplicity of this process, it has the great advantage that the iron itself is not attacked in the least as long as the zinc is in good electrical contact with it. When there is only a little rust a galvanized iron wire wrapped around the object will take the place of the zinc, provided the acid is not too strong. The articles will come out a dark gray or black colour and should then be washed thoroughly and oiled. The method is specially applicable to objects with sharp corners or edges, or to files and other articles on which buffing wheels ought not to be used. The rusted iron and the zinc makes a short circuit battery, the action of which reduces the rust back to iron, this action continuing as long as any rust is left.

To Remove Rust from Nickel Plate.

To remove rust from nickel plate, cover the stains with oil or grease for a few days, and then remove the rust by rubbing with a little ammonia. If this does not remove the rust, try very dilute hydrochloric acid; wash off with water, and when dry, polish with whiting. If this is not successful the only thing to do is to have the articles re-plated.

To Prevent Nickel from Tarnishing.

To prevent nickel-plated articles tarnishing when not in use smear them over with a mixture of four parts of vaseline, one part of paraffin wax, and one part of finely-powdered quick-lime, and wrap them with paper smeared on one side with the mixture.

Waterproofing Textile Fabrics

There are many processes in use for rendering cloth and other textile fabrics waterproof. They depend mainly on the reaction between two or more substances, in consequence of which a substance insoluble in water is deposited in the fibres of the cloth. The following method is used for waterproofing woollen cloth: Dissolve four ounces of powdered alum, and four and a half ounces of sugar of lead (acetate of lead) in three gallons of water, and stir twice a day for two days. When perfect subsidence has taken place, pour off the clear liquid only, and add to it two drachms of isinglass previously dissolved in warm water, taking care to mix the two solutions thoroughly. Steep the garments in this mixture for six hours, after which hang up to drain dry. Wringing must be avoided. Garments treated by this process will be waterproof, but not impervious to air, and will not be attacked by moths. 2. The following is what is known as Lowry's process: Take two ounces of white soap, four ounces of glue, and one gallon of water. Soften the glue in cold water, and dissolve it together with the soap in the water by aid of heat and agitation. The cloth is filled with this solution by boiling it in the liquid for several hours, the time required depending upon the kind of fibre and the thickness of the cloth. When properly saturated the excess of liquid is wrung out, the cloth is exposed to the air till nearly dry, then soaked for five to twelve hours in a solution consisting of thirteen ounces of alum and fifteen ounces of salt in one gallon of water It is finally wrung out, rinsed in clean water, and dried at a temperature of about 80 degrees Fahrenheit.

Waterproofing Canvas or Duck.

A cheap and simple process for waterproofing canvas or duck is as follows: Soft soap is dissolved in hot water and a solution of sulphate of iron (green vitriol or copperas) is added. The sulphuric

acid of the copperas combines with the potash of the soap, and the iron oxide is precipitated with the fatty acid as insolube iron soap. This is washed and dried and mixed with linseed oil and the mixture is applied to the fabric. The soap prevents the oil from getting hard and cracking and at the same time water has no effect on it,

Oilskins.

The material generally employed for seamen's oilskins is fine twilled calico, which is dipped in bullock's blood and dried in a current of air. This is given two or three coats of raw linseed oil, with a little gold size or litharge in it (say, one ounce to a pint of oil.) Each coat should be allowed to dry thoroughly before the next is put on, as before, in a current of air, care being taken to shelter it from both sun and rain. This treatment will, of course, give yellow oilskins; to make them black add a little lamp-black to the linseed oil.

To Preserve Nets.

The following treatment is said to preserve nets for a long time in good condition: Soften one pound of good glue in cold water, then dissolve it in ten gallons of hot soft water, with half a pound of curd soap. Wash the nets in soft water, then boil them in this for two hours, press out excess of the liquid, and hang up over night. Then put two pounds of alum in five gallons of water; heat nearly to boiling. and immerse the nets in this for about three hours, then press out and transfer to a strong decoction of oak bark or a solution of sumac in hot water (5 gals. water and 8 lbs. sumac), and let them remain in this for forty-eight hours, or longer, if convenient. Finally remove from the solution and hang up to dry.

Hektograph.

The following method is recommended for preparing a hektograph, or gelatine copying pad: One part of best gelatine or glue is soaked over night in cold water, and the excess of water poured off. The glue is then warmed in a water bath, with the addition of from ten to twelve parts of glycerine, to which may be added four to six parts of finely-ground heavy spar and one part dextrine, throughly mixed with constant stirring. In summer less glycerine should be used. This melted mixture is poured into a shallow metal box or pan of tin or zinc, and allowed to cool, when it should have the tough elastic consistency of a printer's roller. The letter to be copied is written on a sheet of heavy paper with an aniline ink. When dry it is laid, inked side down, on the gelatine plate, and subject to moderate and uniform pressnre for a few minutes. It is then removed, when a copy of the original will be found on the gelatine plate, which has absorbed a large quantity of the ink.

The blank sheets to receive the copies are now laid one by one on the gelatine plate, subjected to moderate pressure over the whole surface with a wooden or rubber, roller, or with the hand, and lifted off by taking hold of the corners and stripping it gently with an even movement. If this is done too quickly or roughly the composition may be torn. Each succeeding copy thus made will be a little fainter than the preceeding one. As many as forty or fifty legible copies may be had in this manner if the composition is rightly prepared, good ink used, and the operation conducted properly. When as many copies as are wanted have been taken the plate is gone over with a wet sponge and the ink remaining on its surface soaked out. The sponge is then squeezed dry, and the superfluous moisture carefully wiped off, when the plate is ready for another operation. A good hektograph ink is made as follows: Dissolve one part methyl-violet to eight parts water, and add one part glycerine. Gently warm the solution for an hour, and add, when cool, a quarter part alcohol. Or take methyl-violet, one part, water seven parts, glycerine two parts.

To Split a Sheet of Paper.

The best way to split a sheet of paper is to paste a piece of cloth to each side of the sheet to be split. The best flour past should be used. When dry, pull the two pieces of cloth asunder violently and without hesitation, when one side of the sheet will be found to have adhered to one piece of the cloth and the other side to the other piece. By softening the past in water the paper may be easily removed from the cloth. The process is generally demonstrated as a matter of curiosity, vet in can be utilized in various ways. For example, if one wants to paste in a scrap-book a newspaper or magazine article printed on both sides of the paper, and he has only one copy, it is very convenient to know how to detach one side from the other. The paper, when split, as may be imagined, is much more transparent than it was before being subjected to the operation, and the ink is somewhat duller; otherwise the two pieces present the appearance of the original if again brought together.

Tracing Paper.

Thin paper may be made transparent, so that it can be used for tracing, by the following process: Dissolve a given quantity of castor oil in one, two, or three volumes of absolute alcohol, according to the thickness of the paper, and apply it by means of a sponge. The alcohol evaporates in a few minutes, and leaves the paper dry and ready for immediate use. The drawing or tracing can be made either with lead pencil or Indian ink, and the oil removed from the paper by immersing it in absolute alcohol, thus restoring its original opacity. The alcohol employed in removing the oil is preserved for diluting the oil used in preparing the next sheet.

Manifold or Carbon Paper.

Manifold or Carbon Paper is prepared by saturating fine unglazed paper with the following mixture : Tallow, 2 ounces ; graphite in finest powder, ½ ounce ; linseed oil, ¼ pint ; lampblack, sufficient to give the mixture the consistency of cream. Melt and rub together in a mortar. Another formula is 10 parts of lard, one part of wax, and enough finely powdered lampblack to give the mixture the required consistency. Saturate the paper with one of these mixtures, remove the excess, and press.

Typewriter Ribbons.

Typewriter ribbons are prepared in this way : Take vaseline of high boiling point, melt it on a water bath or slow fire, and incorporate by constant stirring as much lampblack or powdered drop black (or whatever orher colour may be desired) as it will take up without becoming granular. If the vaseline remains in excess, the print is liable to have a greazy outline ; if the colour is in excess, the print will not be clear. Remove the mixture from the fire, and while it is cooling mix equal parts of petroleum, benzine, and rectified oil of turpentine, in which mixture dissolve the fatty ink, introduced in small portion, by constant agitation. The volatile solvents should be in such quantity that the filuid ink is of the consistence of fresh oil paint. One secret of success lies in the proper application of the ink to the ribbon. Wind the ribbon on a piece of cardboard, spread on a table several layers of newspaper, then unwind the ribbon in such lengths as may be most convenient, and lay it flat on the paper. Apply the ink, after agitation, by means of a soft brush, and rub it well into the interstices of the ribbon with a tooth brush. Hardly any ink should remain visible on the surface. For coloured inks use the aniline colours.

Transferring Printed Matter.

Prints, such as newspaper cuts, etc., be transferred to paper by the following process : Dissolve 1½ drachms of common yellow soap in one part of hot water, and when nearly cool add 34 fluid ounces of spirits of turpentine and shake thoroughly together. Apply the liquid liberally to the surface of the print with a soft brush or sponge (being careful not the smear the ink, which soon becomes softened), and allow it to soak for a few minutes. Then well damp the plain paper on which the transfer is to be made, place it upon the print and subject the whole to moderate pressure for about one minute. On separating them a reversed transfer will be found on the paper. The transfer will not be equal in intensity to the original, as only a part of the printer's ink is removed. If the ink is very old, a longer soaking and more pressure may be necessary.

To Temper Springs.

The following directions are given by an authority for tempering the different kinds of springs. Steel Springs—Heat to an even-red heat, rather low, to prevent cracking; quench in luke-warm water. Place in ladle with enough tallow to cover it; heat until tallow burns with a large flame extending beyond ladle, then set the ladle aside and allow to cool.—Revolver Springs—Heat the spring to a cherry red, and plunge in linseed oil. To draw the temper to the desired degree, hold the spring over the fire, and allow the oil to burn away; take away from the fire, put on more oil and let it burn away. Burn the oil off three times and plunge in the oil again. The spring is then ready for use. Do not overheat the steel. Test the temper frequently with a file.—Small Springs.—Heat the spring to a light red, plunge in cold water; hold the spring over the flame of a small fire of shavings until it becomes black, then hold in the fire until the black disappears. Cool the spring by swinging it in the air.

Tempering Mill Picks.

There is no great difficulty in tempering mill picks; they should be as hard as possible and moderately tough, and the greatest care should be taken to avoid burning the steel. Where there is much of this work to be done the picks can be heated in a pot of cherry-red-hot lead, then dipped plumb into clear water of about 60 degrees Fahrenheit. Do not draw the temper. The hardening by the ordinary smith's fire can be well done if charcoal is used, and the pick not hurried through the fire, for hurry burns the corners. Much also depends on the shape of the pick, as to whether it is a sectional or leaf pick, or a thick, solid pick, the last being the most difficult to manage, on account of the sharp edge and thick back. A pick of this kind should be laid across the fire, so as to heat the eyes as fast as the edge.

Tempering Drills.

Drills may be tempered by heating to a cherry red in a charcoal fire, then plunging in cold water to which a handful of salt has been added. Make the drill bright. Draw to a light straw colour. Another method is to heat to a low red and plunge in a strong solution of chloride of zinc. Drills tempered in this way will drill glass.

Case-Hardening Tools.

The following process is used in case-hardening tools such as taps, dies, etc.: Have some powdered yellow prussiate of potash (ferrocyanide of potassium) at hand; heat the surface to be case-hardened sufficiently hot to melt this, spindle some on, and again insert in fire and heat to "cherry red," then treat to a bath of clear, cold water. Remove the scale with sandpaper or emerycloth.

The forge is as good a place to harden small or single articles as a regular carbonizing furnace. In factories where much carbonizing is done, a cheaper substance, "bone dust," is employed. The articles are placed in an iron box which is filled with bone dust, then placed in the furnace, and when sufficiently hot treated to the water bath. Parings of horse or ox hoofs, or the hoofs of any animal, to which is added common salt, make a very cheap and effective carbonizer.

Engraving Names on Steel.

To engrave a name on steel with acid it is necessary to protect the steel with some such substance as beeswax, hard tallow, or a mixture of equal parts of asphaltum, Burgundy pitch and beeswax. Warm the steel and apply a thin coating of the wax evenly over the surface. When cold, scratch the required name or design with a pointed instrument so that each stroke penetrates to the steel, and touch the parts with acid (1 part of nitric acid and 1 part of hydrochloric acid to 10 parts of water), using a camel's hair pencil to cover the surface and bring the acid into contact with all the lines. If the effervescence seems too active, add more water. In a few minutes the etching will be done. Dip in hot water to wash off the acid, and clean the surface of the steel by heating it gently and wiping off the wax. Where there are many pieces to be done alike, procure a rubber stamp with the required design made so that the letters that are to be bitten by the acid shall be depressed in the stamp. Have a plain border around the design, large enough to allow a little border of common putty to be laid around the edge of the stamped design to receive the acid. For ink, use resin, lard oil, turpentine and lampblack. To ¼ lb. of resin put 1 teaspoonful lard oil; melt, and stir in a tablespoonful of lampblack, thoroughly mix and add enough turpentine to make it of the consistency of printer's ink when cold. Use this on the stamp in the same manner as when stamping with ink. When the plate is stamped, place a little border of common putty around and on the edge of the stamped ground. Then pour within the border enough acid mixture to cover the figure, and let it stand for a few moments, according to the depth required, then pour the acid off. Rinse the surface with clean water; take off the putty border, and clean off the ink with turpentine. Use care not to spill the acid over the polished part of the article.

Lacquering Brass.

The following is a good lacquer for brass: To five ounces of alcohol add enough gamboge to give a bright yellow colour, and three ounces seed lac in fine powder. Put in a sand bath till dissolved. Other recipes are: (1) Gamboge, ½ ounce; aloes, 1½ ounces; fine shellac, 8 ounces; alcohol, 1 gallon. (2) Alcohol, 1 pint; turmeric,

1 ounce; annatto and saffron, of each 2 drachms. Agitate frequently for a week, filter into a clean bottle and add seed lac, 3 ounces. Let it stand with occasional agitation for about two weeks. (3) Put 3 ounces seed lac, 2 drachms dragon's blood, and 1 ounce turmeric powder into 1 pint of alcohol. Let the whole remain for a couple of weeks, shaking the bottle once a day during that time. When thoroughly dissolved, strain the liquid through muslin and it is ready for use. In lacquering, everything depends on having the brass-work free from grease or dirt. Unless you are very careful on this point you will never have satisfactory results. The cleansing of the brass may be accomplished by boiling in lye till apparently clean, then placing in a vessel containing a solution of nitric acid, in the proportion of one part of acid to three or four of water. Let the brass remain in this for an hour, afterwards washing well, then dip in the following bath: Mix equal parts of nitric and sulphuric acids, and add to it about one-third part extra of nitric acid, having zinc dissolved in it in the proportion of about one zinc to three acid. Dip the brass in this till it has the colour desired; twenty to thirty seconds will be ample. Then rinse well in plenty of water, and place in sawdust till dry. When dry rub up with soft rags and a leather. Heat the brass in an oven, and when just too hot to hold, apply the lacquer with a fine camel's hair brush, and put it again in the oven for a few minutes to make the lacquer smooth and even. To obtain good results put on at least two coats. Avoid handling the work while lacquering, or until it is quite cold. In using the acids mentioned care must be taken not to inhale the fumes given off, as these are most deleterious. It is best to conduct the operation out of doors or in a chimney place that has a good draught. In mixing the nitric and and sulphuric acids, add the latter to the former in very small quantities at a time, stirring with a glass rod after each addition. Be careful not to allow any to spurt or spill on the skin, as it will produce a painful sore.

Fusible Metals.

There are a number of alloys of metals which melt at the temperature of boiling water or even below this. Some of them are used to make trick spoons which surprise those to whom they are furnished by melting in their tea or coffee. What is known as D'Arcet's alloy is composed of eight parts of bismuth five parts of lead, and three parts of tin. This melts below 212 deg. Fahr. Another alloy, which melts at 197 deg. Fahr., consists of three parts of lead, two of tin and five of bismuth. If to the latter, after removing it from the fire, one part of warm quicksilver be added, it will remain liquid at 170 deg. Fahr., and become a firm solid only at 140 deg. Fahr.

Repairing a Mirror.

The method of repairing a mirror depends entirely upon its character. If it is a silver mirror, it is best to remove the entire coating and re-silver it. It takes an experienced man to get good results, and it is very doubtful if it would pay an amateur to undertake such a task. If the mirror has a mercury back, you may be successful in a trial of one of the followiug methods: (1) Clean the bare portion of the glass by rubbing it gently with fine cotton, taking care to remove any trace of dust and grease. If this cleaning is not done very carefully, defects will appear around the place repaired. Upon the back of another looking glass cut with the point of your knife around a portion of the silvering of the required form, but a little larger. Upon it place a small drop of mercury; a drop the size of a pin's head will be sufficient for a surface equal to the size of a nail. The mercury spreads immediately, penetrates the amalgam to where it was cut off with the knife, and the required piece may now be lifted and removed to the place to be repaired. This is the most difficult part of the operation. Then press lightly the renewed portion with cotton; it hardens almost immediately, and the glass presents the same appearance as a new one. (2) Pour upon a sheet of tinfoil about three drachms of quicksilver to the square foot of foil. Rub smartly with a piece of buckskin until the foil becomes brilliant. Lay the glass upon a flat table, face downward; place the foil upon the damaged portion of the glass; lay a sheet of paper over the foil, and place upon it a block of wood or piece of marble with a perfectly flat surface; put upon it a sufficient weight to press it down tight; let it remain in this position a few hours. The foil will adhere to the glass.

Storage Batteries.

Storage or secondary batteries are so called because they store up the electric current as the Leyden jar stores up the discharge from an electric machine. The first secondary battery of Plante was made of sheet lead plates, or electrodes, kept apart by linen cloth soaked in diluted sulphuric acid. It was "charged" by connecting the plates to a primary battery, when peroxide of lead was formed on one plate and spongy lead on the other. When the charging current was cut off, the peroxide plate became the positive and the spongy plate the negative pole of the secondary cell. Faure improved the Plante cell by adding a paste of red lead and diluted sulphuric acid, by which a large quantity of peroxide and spongy lead could be formed on the plates. The efficiency of the cell was subsequently increased by putting the paste into holes cast in the lead. The secondary cell is now made in various forms. One that has been found very satisfactory consists of a glass box containing two sets of leaden grids perforated with holes, which are primed

with the paste and steeped in dilute sulphuric acid. Alternate grids are joined to the pole of a charging battery or generator, those connected to the positive pole being converted into peroxide of lead and the others into spongy lead. The terminal of the peroxide plates, being a positive pole of the accumulator, is painted red, and that of the spongy plates, or negative pole, black. Accumulators of this kind are useful as reservoirs of electricity for maintaining the electric light or working electric motors in cars, automobiles, launches, etc. The chief obstacle in the way of their more general use is their weight, which, on account of the leaden plates, is considerable.

Electro-Plating.

The outfit necessary for electroplating consists of a battery or other means of supplying a current of electricity, the plating bath and the materials for cleansing and preparing the articles to be plated. In nearly all electroplating establishments some form of dynamo-electric machine is now employed to supply the electricity, but as their first cost is considerable, and they require power to operate them, the battery is still in requisition for amateurs. Any common form of battery may be used. For practical purposes the electricity may be said to proceed from the copper or carbon pole of the battery, and care should be taken that this pole is invariably connected (by copper wire) with the anodes or feeding plates in the bath, and the zinc pole with the wire from which the articles are suspended. For nickel plating, anodes of pure cast nickel are used; for silver plating the anodes are plates of silver, or heavy silver foil.

Before work can be plated, its surface must be perfectly clean. Oil, grease, etc., are removed by boiling the articles in a strong solution of caustic potash, and thoroughly rinsing in water; they are then dipped in dilute nitric acid and again rinsed to free them from oxide. If the articles are of brass, copper or German silver, they may be cleansed by scouring with fine pumice stone, and a strong solution of cyanide of potassium. Just before putting the work into the bath, dip it momentarily into nitric acid and rinse quickly. It should be placed in circuit immediately after this. The articles must not be touched with the hands after being

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cleansed. Any suitable vessel will do to contain the solution; an enamelled iron tank or a glazed stoneware pot answers very well, if the articles are small.

The substance generally employed in preparing the bath for nickel plating, is the double sulphate of nickel and ammonium, or "nickel salts," a crystalline salt of beautiful emerald green color. Ten parts of this, and two and one-half to five parts of pure boracic acid are dissolved in 150 to 200 parts of water. The nickel salt and boracic acid may be dissolved separately in boiling water, the solutions mixed, and the volume brought up to that of the formula, or the two solids may be dissolved together.

For silver-plating the double cyanide of silver and potassium is almost universally employed. The baths are used either hot or cold. The composition of the bath is as follows: Soft water, one gallon; cyanide of potassium, eight ounces; nitrate of silver, five and a quarter ounces. Dissolve the nitrate of silver in a sufficient quantity of water, and add to it gradually with constant stirring hydrocyanic (prussic) acid until all the silver has been precipitated as cyanide, which may be known by the formation of no cloud in a portion of the clear liquid when a drop of the acid is added to it. Avoid adding an excess of the acid. Throw the precipitate upon a fine cotton cloth filter and wash it several times with pure water. Dissolve the cyanide of potassium in water and stir in the cyanide of silver carefully removed from the cloth. If it does not dissolve in the liquid entirely, add more cyanide of potassium until it does, stirring continually. Let the impurities settle, and the bath is ready for use.

Fire Extinguishers.

Various substances are employed for extinguishing fire, the commonest being carbonic acid, a gas which is incapable of supporting combustion and thus chokes a fire in a closed space. Water is capable of absorbing large quantities of carbonic acid under pressure, and some forms of fire extinguishers are merely strong vessels containing water charged with the gas. More usually, however, the apparatus contains the necessary ingredients for generating the gas; these are kept separate until needed and by simply turning a handle or inverting the apparatus they are mixed and the gas is produced. One form of this extinguisher consists of a cylinder which is filled with a solution of bicarbonate of soda. Inside the cylinder a thin glass bottle of sulphuric acid is fastened, and this is broken when needed by turning a crank or pressing a lever. This liberates the acid, which mixes with the solution of bicarbonate of soda and generates carbonic acid. The pressure is considerable, and when the nozzle is opened, the water—now charged with gas—is forced through it, and issues in a stream which is directed on the flames.

Among other substances employed as fire extinguishers are ammonium sulphate, and chloride, borax, sodium phosphate, tungstate, sulphate, and bicarbonate, and water glass. Chloride of ammonium (sal-ammoniac) gives partially satisfactory results in the following mixture: (1) Common salt, 3 parts; bicarbonate of soda, 4; sal-ammoniac, 3. (2) Sodium sulphate, 3; sodium bicarbonate, 2; sal-ammoniac, 5. Another mixture that is recommended consists of 8 parts of common salt, 6 of baking soda, 2 of Glauber's salts, 2 of calcium chloride, and 2 of sodium silicate. In Germany an extinguisher is used in the form of a cardboard case containing a powder, which, when set fire to, produces a gas capable of choking a fire. This powder consists of a mixture of 30 parts of flower of sulphur, 60 of saltpetre, and a small quanting of charcoal and oxide of iron.

Charcoal Burning.

Charcoal burning is usually carried on by firing conical piles of billets of wood, about twelve feet in height, and ten to forty feet in diameter, from the top of a central hole or chimney. The wood is felled in winter and must be tolerably dry; it is built up with the bark outmost, the largest billets being placed in the interior of the pile, and over the whole is laid a covering of turf, or of charcoal dust and soil. The combustion of the wood is conducted from above downwards, and from the exterior inwards. At the sides of the heap are holes for the admission of air, the size and number of which are a matter of importance. The first or "sweating" process lasts three or four days, during which the cover becomes damp from condensed water. The openings round about the base of the pile are then covered, and a series of holes is made about half-way from the top of the heap; as the smoke ceases to issue from these they are closed, and other series of holes are made below, as required. The tarry products which collect towards the close of the operation are removed from the heap by means of gutters or pipes. When the air-holes of the burning heap no longer emit smoke and flame, they are carefully stopped, and the pile is allowed to cool for two or three days. The charcoal is then drawn, and any pieces which are still glowing are quenched by plunging them into water or sand. Wood charcoal is employed as a fuel and as a reducing agent in metallurgy. It is also used in filters, and is administered as a medicine. Animal charcoal made from bones is largely employed as a decolorizing, deodorizing and filtering agent, and, more especially in the form of ivory black, as a pigment.

Canning Fruit.

Fruits are in proper condition to can when they are fully ripe, but not soft and mushy. Even then, provided they are not actually decayed, they may be canned, but they will not in that case have a

fine appearance. Glass vessels are of course the best to keep the fruit in, but tin cans will do, though when they are employed there is always a danger of the fruit acids dissolving a portion of the tin. If no regard is had for fine appearance, the easiest way to can fruit is to cook it in a porcelain or graniteware kettle, and when cooked pour into cans or jars and seal at once. If the finest appearance is desired, the fruit (peeled and cut, if necessary, with a silver knife to prevent discoloration) is arranged nicely in the jars which are then filled with syrup. The amount of sugar in the syrup is a matter of taste; from four to eight ounces to the quart of fruit is generally used. Cranberries would require about ten ounces of sugar. The filled jars are now placed in a boiler with water enough to come up nearly to the neck, and covers loosely put on, and the whole brought to the boil and kept so long enough to cook thoroughly. When glass jars are used it is necessary to place slats of wood on the bottom of the boiler and straw between the jars to prevent their breaking when the water begins to bubble. The fruit will shrink considerably in the cooking, and some should be cooked in a separate dish to fill up the jars if necessary. As soon as the fruit is cooked enough, remove the jars from the boiler, take off the covers and fill up as full as possible with boiling hot syrup; wipe the top and neck clean, put on the rubbers, and screw down the tops as tightly as possible. Store in a cool dark place.

Purifying Lard.

Cleanliness is the great point in treating lard. The fat is first freed from all adhering fleshy or discoloured matter, and is then cut up into small pieces and washed until the water runs off clear. It is next melted by direct fire or steam coils until it becomes perfectly clear, and is run through close linen filters into barrels, in which it is stirred until white and opaque, but only thickly fluid. The great point is when to cease stirring. It is then cooled and tightly covered. To bleach it proceed as follows: In a copper boiler put half a gallon of water and 100 pounds of rendered tallow; melt over a slow fire, and add while stirring one pound of oil of vitriol, previously diluted with 12 lbs. of water; afterwards half a pound of bichromate of potash, in powder, and lastly thirteen pints of water, after which the fire is suffered to go down, when the tallow will collect on the surface of the dark green liquid, from which it is separated. It is then of a fine white, slightly greenish colour, and possesses a considerable degree of hardness.

To Renovate Rancid Lard.

Heat to the boiling point ten pounds of the fat to be purified, one gallon of water, and one ounce of sulphuric acid; let the mixture boil for a quarter of an hour and then remove it from the

fire. Now add 4½ ounces of pulverized chalk and let the mixture cool. The purified fat separates from the water and the excess of lime, and the small quantity of moisture remaining in the fat can be removed by heating.

Compressed Yeast.

Compressed yeast is made by the following process: Corn, barley and rye, all sprouting, are powdered and mixed, and then macerated in water at a temperature of from 149 to 167 deg. Fahr. The conversion of the starch in the grains into sugar takes place in a few hours, when the liquor is racked off and allowed to clear, and fermentation is set up by the help of a minute quantity of any ordinary yeast. Carbonic acid gas is disengaged during the process with so much rapidity that the globules of yeast are thrown up by the gas, and remain floating on the surface, where they form a thick scum. The latter is carefully removed and constitutes the best and purest yeast, which, when drained and compressed in a hydraulic press, can be kept from eight to fifteen days, according to the season.

Lye from Wood Ashes.

A common barrel set upon an inclined platform makes a very good leach for preparing lye from wood ashes, but one made of boards set in a trough in V-shape is to be preferred, for the strength of the ashes is better obtained, and it may be taken to pieces when not in use and laid away. First put a few sticks in the bottom of the leach; over them spread a piece of carpet or woollen cloth, which is much better than straw; put on a few quarts of ashes, and from eight to nine quarts of lime; fill up with ashes moistened, and tamp down well—firmest in the centre. It is difficult to obtain the full strength of ashes in a barrel, without removing them after a day's leaching, and mixing them up, and replacing. The top should be first thrown off and new ashes added to make the proper quantity. Use boiling water for second leaching. The lye should be sufficiently strong to float a potato.

To Clean Furs.

A good way to clean and restore dark furs is as follows: Heat a quantity of new bran in a pan, taking care that it does not burn, stir constantly. When well heated rub thoroughly into the fur. Repeat two or three times. Shake the fur and brush briskly until free from dust.

To Remove Iron Stains from Clothing.

Keep a bottle of strong solution of oxalic acid, plainly labelled "Poison," in a handy place for use on washing day. Gather up the cloth round the spot of rust and dip the spot in cold water, then

in the acid, and then in rapidly boiling water, holding it in the steam a few minutes. If the spot does not quickly disappear, repeat the process. The steam seems to be necessary with the acid. Then rinse thoroughly.

To Remove Stains from Furniture.

Stains may be removed from furniture and woodwork by using a polish made as follows: To one pint of spirits of wine add half an ounce of ground resin and an ounce and a half of gum shellac. After the resin and the shellac have been dissolved by the spirit, mix in one pint of linseed oil, and shake the whole well. Apply with a cloth and polish with a soft flannel.

To Remove Stains from the Hands.

The following method is often successful in removing dirt of various kinds from the hands: Wash the hands well with raw linseed oil, using it as you would water, and rubbing it well into the skin; then rub the hands with sawdust until the oil is all absorbed, and finally wash with warm water and some good cleansing soap.

Javelle Water.

Eau javelle, or javelle water, which is used for whitening soiled linen and removing stains, is composed of bicarbonate of soda and chloride of lime. Put four pounds of the soda into a kettle over the fire, add one gallon of boiling water, let it boil ten to fifteen minutes, then stir in one pound of chloride of lime, free from lumps. Use when cool.

Malt Vinegar.

Malt vinegar is made by brewing a weak wort from malt exactly as for beer. To one hundred gallons of this, at a temperature of 70 degrees Fahr., are added four gallons of yeast, and well stirred through for eight or ten minutes. The mixture is allowed to ferment actively for two days, and is then transferred to the stoving room; here it is distributed into a number of tubs, which, when filled, are covered over with coarse canvas. This room is dark, and is heated with stoves and the heat is constantly sustained for weeks until the conversion of the wort into vinegar is complete. The process of acetification is hastened by introducing into the casks with the wort either the residuary fruit used in making domestic wine or the foot-stalks and skins of grapes. This "rape," as it is called, acts as a kind of ferment. Various other processes are used by different manufacturers for the purpose of producing it quicker. These have for their purpose the more perfect exposure of the wort to the air, and the consequent more rapid fermentation of it. This is effected by allowing the wort to trickle from one barrel to another over beechwood shavings, a large surface of the liquid being thus exposed to the action of the air.

DAINTY DISHES.

Mutton Broth with Barley.

Put two pounds and a half of mutton—not lamb—chosen from the shoulder, into a small kettle with a quart to three pints of cold water and a scant teaspoon of salt. Let it heat slowly. As soon as it begins to bubble remove the scum. Do not allow the broth to boil, but keep it just below the boiling point until the meat is thoroughly cooked, when it should, be removed from the fire and poured off into an earthen dish, leaving the meat for some other use. There should be one quart of the broth.

The barley should be cooked from six to ten hours in a double boiler, using one cup barley to four cups water. When thoroughly cooked strain and keep in an earthen dish.

Use broth and barley together—heating the broth and adding whatever amount of barley seems inviting to the invalid.

A portion of the fat should be allowed to remain in the broth as it is healing to inflamed tissues.

Both barley and broth must be carefully prepared by long and slow cooking, or the desired results will not be attained.

Fish Chowder.

Fry in a large pot some pieces of fat pork well seasoned with pepper. When done, remove the pork and put in some slices of peeled onions, then some fresh fish—cod, rock or black fish - with a layer of sliced potatoes. Add one pint of water and let it stew half an hour ; then add one pint of milk, thickened with flour, let it boil up, and serve hot.

Celery Soup.

Boil three or four heads of celery, with an onion and three large potatoes, until tender. Drain them, and pass all through a sieve. Dilute the pulp to the right consistency with equal parts of milk and water in which the vegetables were boiled, and half an ounce of butter rolled in flour, season with white pepper and salt, boil up and serve. Hand dice of fried bread with the soup.

Oyster Soup.

Remove the beards from four dozen good-sized oysters and reserve the liquor. Melt a quarter of a pound of fresh butter in a stewpan, then add six ounces of flour, and stir this over a slow fire for a short time, taking care that it does not acquire any colour. Let it cool, then add the liquor and beards of the oysters, a quart of milk, and two quarts of good stock. Stir over the fire until boiling, and add the seasoning, consisting of a teaspoonful of salt, half a saltspoonful of cayenne, five peppercorns, half a blade of mace, a tablespoonful of catsup, and half a tablespoonful of essence of an-

chovies. Let all boil quickly together for ten minutes ; meanwhile place the oysters, a few at a time, in a potato steamer, and let them remain, covered up, above fast boiling water for two seconds, just long enough for the heat to surround them with a thin film. Put them into a well heated tureen. Skim the soup well, add a gill of fresh cream, and strain through a hair sieve on to the oysters.

French Omelet.

The following is the French method of making omelets : Beat together two or three whole eggs, according to the size of your omelet, till the whites and yokes are broken and well mixed, but not actually whisked, then season to taste with pepper, salt, minced parsley, chives, or shallot, etc. Melt 1½ ounces of butter in the frying pan (you should allow ½ ounce of butter for each egg), and when this is melted and has ceased to smoke, put into it the egg mixture ; let this rest quietly on the fire for a minute or so till a thin layer of cooked egg has formed on the bottom of the pan. When the egg is properly set in this way, if you tilt the pan a little, tiny puffs of steam will arise ; lift the edge of this set part with a broadbladed or palette knife, and allow as much of the uncooked egg to run over from the top as you can, repeating this till no fluid is left, and the surface of the mixture is set like scrambled eggs. Slip the knife right under the omelet, fold one half over the other, and either slide it gently on to the hot dish ready for it, or lay the dish over the frying pan, reversing the latter so that the omelet falls gently into place, and serve at once, for no omelet should ever have to wait. An omelet, not being a pancake, should never be turned whilst cooking, and it should be sent to the table directly the egg on the surface is just, and only just, set, or it will make its apearance as tough as leather, for eggs continue to cook for some seconds after they leave the fire.

Baked Eggs.

Sprinkle some buttered molds with chopped parsley, break a fresh egg into each, put on top a small piece of butter, and seasoning of salt and pepper, and bake until the egg is set. Have ready some rounds of buttered toast, one for each egg, and sprinkle them with grated cheese. Turn an egg out on each round of toast and serve hot with brown gravy or any sauce preferred.

Mutton Chops a la Delmonico.

Flatten and pare nicely six thick mutton chops, season them with salt and pepper, oil them slightly with sweet oil, rubbing it on either side, then broil. Be sure not to cook too long, and when done squeeze a small bit of lemon juice on each chop and serve in a hot dish.

Pigeon Pie.

Choose four pigeons, and, having drawn, cleansed and trussed them nicely, blanch and mince the livers with one ounce of beef marrow, four peeled mushrooms, one-half pound of veal, some picked herbs and a tablespoonful of fine bread crumbs. Season it with salt, pepper and grated nutmeg, mixing it all through, and then put a tablespoonful of the mixture in each bird. Line a pie-dish with some of the forcemeat, and, after putting in the birds, arrange tiny rolls of thinly sliced bacon and slices of hard-boiled eggs between the layers, with small dabs of butter at intervals. After this is done, cover the pie with a good paste, leaving a hole in the centre. After baking in a moderate oven, and just before serving, pour a gill of clear rich gravy into the pie through this centre opening.

Boiled Turkey.

Wash the bird in lukewarm water, dry well, and truss it neatly; then rub the breast all over with a halved lemon, wrap in a buttered paper, and then in a floured cloth. Now bring some slightly salted water just, but not quite, to the boil; lay in the bird, watch the water boil up, then at once draw the pan to the side, and keep it simmering slowly until the turkey is cooked, remembering that the slower it is cooked (in reason) the tenderer and more succulent it will be. The time it takes to cook depends on the age and size of the bird. An average-sized bird, cooked very slowly, will generally take from one hour and forty-five minutes to two and a half hours.

Hare with Catsup.

Cut in pieces, season with salt, pepper and minced parsley. Fry brown. Into a double boiler put a layer of very thinly-sliced bacon, then a layer of rabbit with a sprig of thyme, a little nutmeg, cloves, mace and lemon juice. Repeat the layers until all is used. Pour in one-half pint of boiling water, set in a kettle of hot water and boil two hours; add a little melted butter and flour to thicken the gravy, season with pepper, salt, and a teacupful of tomato catsup.

Chateaubriand Steak.

There is nothing a man appreciates more than a good chateaubriand steak and it is something that is seldom found to perfection on the home table. The following is an excellent recipe. Trim off fat and skin from three pounds of beef, cut from centre of fillet, and flatten with broad-bladed knife. Sprinkle with salt, brush over with olive oil and broil for twenty minutes. With it serve the following sauce, which is the most important part: Cook three tablespoons butter, one slice carrot, one slice onion, bit of bay leaf, sprig of thyme, sprig of parsley, and half teaspoon pepper-

corns, until butter is browned. Add four tablespoons flour, one and a half cups brown stock, and one-half teaspoon meat extract. Bring to boiling point, strain, add one tablespoon lemon juice, two tablespoons chopped parsley, one tablespoon butter, bit by bit, and salt to taste.

Creamed Sweetbreads.

Place the sweetbreads in cold water for an hour, then parboil twenty minutes in boiling water, to which has been added one-half teaspoon of salt and one teaspoon of lemon juice. When taken from the boiling water place again in cold water; this keeps them firm and white Make a sauce of the cup of milk, two tablespoons entire wheat flour, one-fourth teaspoon of salt, one-sixteenth teaspoon of white pepper. Break the sweetbreads into small pieces and reheat in the sauce.

Little English Pork Pies.

Heat together two pounds of flour, half a pound of butter and half a pound of finely minced mutton suet. When melted, mix into a stiff paste, and put before the fire with a cloth over it until ready to make up. Chop the pork into small pieces, season with salt, pepper and powdered sage; divide the paste into rather small pieces, raise in a round or oval form, fill with the meat and bake in a rather hot oven.

To Fry Chicken.

Wash until free from blood; unjoint all the joints; sprinkle with salt and pepper; cut the breast in pieces; lay in a frying pan with a generous lump of butter; cover tight; fry till a nice brown; make a gravy of cream and butter; thicken with a little flour; season to taste.

Boiled Chicken.

To boil chickens, wash the bird nicely in lukewarm water, and when trussed rub it all over, the breast especially, with half a lemon, then wrap it in a buttered paper and next in a floured cloth; bring some slightly salted water all but to the boil, lay in the fowl, watch the water re-boil, draw the pan to the side, and let it simmer slowly till the fowl is done, remembering that the slower it cooks the tendered it will be; a young fowl will take from twenty to twenty-five minutes. It is then lifted out of its wrappings, set on a hot dish, and served with any sauce and garnish to taste. Cooked thus, the fowl keeps beautifully white.

Macaroni and Cheese.

For baked macaroni take about three ounces of macaroni and boil until tender in a stew pan with a little water. Take pudding dish or pan, warm a little butter in it, and put in a layer of macaroni, then a layer of cheese grated or cut into small bits and sprinkle

over with salt, pepper and small pieces of butter, then add another layer of macaroni and so on, finishing off with cheese. Pour on rich milk or cream, enough just to come to the top of the ingredients and bake from one-half to three-quarters of an hour. Some add a layer of bread or cracker crumbs over the top.

For boiled macaroni pour a pint of boiling water over five ounces of macaroni, let stand for half an hour, drain and put in a custard kettle with boiling milk or milk and water to cover, cook till tender, drain, add a tablespoon butter, teacup of cream, season with salt and pepper. When hot, dish, grate cheese over the top and serve.

Rice and Curry.

Cut into dice two cupfuls of cold roast beef, veal, lamb, mutton or chicken. In a frying pan melt three tablespoonfuls of butter, and fry in it a sliced onion. Take out the onion and stir into the butter two tablespoonfuls of browned flour mixed with a tablespoonful of East India curry powder. When well blended, pour in a pint of stock and stir to a smooth brown sauce. Now add the cold meat, which should have been seasoned with salt and pepper. Toss and stir until heated through. Serve with boiled rice. It should be accompanied by bananas.

Mayonnaise.

A reliable recipe for mayonnaise dressing calls for the yolks of two hard boiled eggs pressed through a fine sieve. Add, one at a time, the yolks of two raw eggs rubbed perfectly smooth ; then a saltspoonful of salt and a dash of cayenne paprika. This mixture should be smooth and creamy. Add to it, drop by drop, half a pint of olive oil, alternating with lemon juice or vinegar, a few drops at a time. It is an art to succeed with mayonnaise dressing in summer. All the ingredients must be ice cold and the bowl in which they are mixed should be set on a piece of ice or in a pan of cold water during the mixing operation.

Sauer Kraut.

To make sauer kraut, remove the outer leaves and cores of the cabbages, cut up finely and put down in a large keg or jar, with a very little sprinkle of salt between each layer, and pound well

down with a wooden masher or mallet. When the jar is full, place some large cabbage leaves on top, and a double cloth wrung out of cold water. Then a cover with a very heavy weight on it—a large stone is best—and let it stand for six weeks before using, being careful to remove the scum that rises every day by washing out the cloth, the cover, and weight, in cold water. After six weeks pour off the liquid and fill the jar with clear, cold water. This makes the sauer kraut, nice and white. To cook sauer kraut, pour enough boiling water over the quantity you wish to use to cover it, and boil for three hours, keeping it well covered. A piece of salt pork may be boiled with it if desired, or it may be boiled down and fried in butter.

Sweet Grape Pickle.

Seven lbs. of ripe grapes (wild or any kind), 1 pint of good vinegar, 1 tablespoonful each of cloves, ginger, allspice and cinnamon, three pounds of sugar ; make a syrup with the vinegar, sugar and spice, separate the grape pulp from the skins ; stew the pulp and strain out the seed ; add the skin and cook in the syrup until thick, and seal.

Cucumber Pickles.

To pickle cucumbers so that they will be green and crisp, make a brine that will bear an egg, and drop in the cucumbers ; cover them with grape leaves ; weigh them down, and let them stand ten days or longer. Then take them out, drain well, and soak a day or two in plenty of clear water, frequently changed ; then put them in a kettle with grape and cabbage leaves and a lump of alum. Cover with weak vinegar and let them stand until they turn green ; take out, drain, and put into stone jars. For each three gallons of pickles, use one gallon of cider vinegar, one ounce each of mace and celery seed, two ounces of ginger, three ounces each of cloves and stick cinnamon, four ounces each of mustard seed (black and white mixed) black pepper and allspice, two tablespoonfuls of ground mustard, a handful of chopped horseradish, two pods of red pepper, four onions, and two pounds of sugar. Boil and pour it hot over the pickles. Cover the jars closely.

Fish Souffle.

Fish and oysters are standbys of the Lenten menu, and a fish souffle is a French entree which is appreciated as well in this country. To make the souffle put one an a half gills of milk into a small saucepan with one onion, two cloves and a few strips of lemon peel, a little celery, salt and pepper. Let them simmer gently for half an hour. Melt two ounces of butter in another saucepan and mix with it gradually two ounces of flour. After straining the milk add to it the mixture and continue to stir until

a smooth paste is formed. Have ready one pound of raw fish freed from skin and bones and minced. Add the sauce gradually, pounding it into the fish, and then the yolks of three eggs in the same way. Season the mixture with salt, pepper and nutmeg and pass it through a wire sieve. Add a pinch of salt to the whites of the eggs and whisk them to a stiff froth. Mix lightly with the prepared fish and place at once in a buttered souffle mold. Tie a piece of greased paper over the top and steam the souffle very gently for three-quarters of an hour. If not firm to the touch let it cook a few minutes longer.

Fish Rechauffee.

Into a chafing dish put two tablespoonfuls of butter, and when melted add a cupful of shredded fish of any preferred kind. Then stir in half a cupful of bread crumbs, two beaten eggs, a teaspoonful of anchovy paste, a pinch of cayenne pepper, and two tablespoonfuls of milk. Stir the mixture constantly, and let simmer for a few moments. Remove the outer dish, and allow the mixture to brown a little before serving.

Pickled Oysters.

Take as many of the best oysters as you wish to pickle ; put them upon the fire in a stew-pan in their own liquor, stir them occasionally ; when the liquor boils, take them off and drain through a sieve ; let the liquor settle, and pour off the clear part, and put it on to boil, with half an ounce of whole black pepper, a little all-spice and salt, and boil it fifteen minutes. Put in the oysters and let them boil one minute ; then put them into a jar, and let them stand until cold, then seal the jars.

Creamed Potatoes for Breakfast.

Heat a cupful and a half of milk, and add a heaping teaspoonful of butter, which has been rubbed in the flour until smooth. Pepper and salt this well ; take two cupfuls of cold boiled potatoes which have been sliced and put them in the hot milk. Shake and stir until done, and pour into a deep dish and serve while hot with breakfast.

Stuffed Tomatoes.

Scrape the centres from tomatoes with a spoon, after cutting off the tops. Boil two tablespoonfuls of well-washed rice in a quart of boiling water for about half an hour, until tender, then drain ; melt two even tablespoonfuls of butter in a frying pan, add a teaspoonful of minced onion and, after frying slowly for ten minutes, add the centres of the tomatoes, the boiled rice and a saltspoonful of salt. Mix well and add as filling in the tomatoes. Scatter bread-crumbs on top of each and bake in an open buttered pan for twenty minutes.

Scalloped Cauliflower with Cheese.

For a cooked cauliflower of medium size make a sauce of three level tablespoonfuls each of butter and flour, a scant half teaspoonful each of salt and paprika, and a cup and a half of rich milk. Butter an au gratin dish, and in it arrange the cauliflower, separated into flowerets and each stem trimmed to a point. Dissolve half cup of cheese in the sauce, then pour the sauce over the cauliflower and sprinkle the whole thickly with cracker crumbs mixed with melted butter. Set in the oven to brown the crumbs.

French Fried Potatoes.

Select long potatoes, peel and cut lengthwise in quarters, throw into cold water for half an hour, then dry with a cloth. Have a kettle of hot lard, test it with one piece before putting the others in; fry quickly. When you can put a fork through them easily they are done; drain on brown paper in a colander, sprinkle salt over them, and serve.

Panned Mushrooms in Cream Gravy.

Melt three balls or one tablespoonful of butter with salt, white pepper and paprika to taste; add whole mushrooms, fresh or canned; saute until tender. Remove to triangles of lightly buttered toast; add half a cupful of good cream to the gravy, boil up once and pour on a little plate. These are delicious.

A New Salad.

A new salad excellent with meat or poultry. An equal number of thinly cut slices of cucumber and apple, in alternate layers, and poured over them a sauce cream, sharpened with a strong dash of vinegar, and showered with mint, cut as finely as ever possible. A little castor sugar may be added, also a piece of salt. This salad has a flavour particularly refreshing to the palate.

Farmer's Salad.

Prepare a quantity of lettuce by cutting with scissors into shreds, and if one has watercress or the pungent pepper-grass or garden cress, a fourth quantity of either added to lettuce is a great improvement. Just before serving, mix with a dressing made by beating a half pint of sour cream until stiff and adding slowly two tablespoofuls of strong vinegar, two of melted butter, a saltspoonful of salt, one tablespoonful of sugar and a dash of Cayenne pepper. If one has fresh drippings from fried pork it answers very well in the place of butter. This is essentially a farm salad.

Milk Bread.

For milk bread with a sponge, pour two cupfuls of scalding milk on a tablespoon each of sugar and lard and a level teaspoonful of salt. When cooled to 70 degrees add a cake of compressed yeast

dissolved in a half cupful of tepid water. Stir in three and one-half cupfuls of sifted flour and beat well. Let rise until very light, when add more flour to knead and work it until smooth and fine grained. Let it rise in the bowl until it doubles its bulk. Divide in two, shape into loaves, place in greased breadpans and bake forty-five minutes in an oven that will brown flour in five minutes.

Indian Breakfast Rolls.

Three-fourths cup of molasses, one cup of sour milk, one and one-half cups flour, one cup Indian meal, one-half teaspoonful salt, one teaspoon saleratus dissolved in one tablespoonful cold water and well beaten in the last thing. This will make twelve rolls in a common cast-iron compartment pan, which must be heated and fatted. Put a spoonful of the dough in each division and then distribute the rest evenly. Bake twenty-five or thirty minutes in a moderate oven.

Oat Wafers.

Oat wafers are much liked with a glass of milk by children. Mix one-half cup of rolled oats, half a cup of flour, a tablespoonful of sugar, and a little salt. Work into the mixture, with the tips of the fingers, a tablespoonful and a half of butter, and add enough hot water to hold the materials together. Lay on a floured board and pat and roll out as thin as possible. Cut into oblong strips with a thin knife, and bake to a delicate brown in a slow oven.

Whole Wheat Bread.

To make whole wheat bread dissolve a cake of compressed yeast in a half-cup of lukewarm water. Mix a pint of scalding milk with a pint of boiling water, add a teaspoonful of sugar and one of salt, and set the mixture aside until bloodwarm, then stir in the dissolved yeast. Into a large bowl put a quart of whole wheat flour, and stir into it the lukewarm liquid. Beat hard and steadily for five minutes after the flour is incorporated, then add enough whole wheat flour to make a dough that can be kneaded. Knead for fifteen minutes, then cover with a towel, and set to rise in a warm place. At the end of three hours make into loaves; knead each of these for five minutes, then set in greased pans. Let them rise for about an hour before baking.

Buckwheat Cakes.

Pour two cups of scalded milk over one-third cup of bread crumbs grated or rolled fine. Add salt and one-quarter yeast cake dissolved in one-half cup of lukewarm water. Also add buckwheat to make a batter thick enough to pour. Let rise over night. In the morning beat well, add one tablespoonful of molasses, one-fourth teaspoonful of soda dissolved in one-fourth teacup of warm

water. Bake, saving one-half cup of batter with which to start another mixing made in the same proportions.

English Crumpets.

Put one pint of fresh milk into a saucepan with one and one-quarter ounces of butter, stand the pan over the fire until the butter is melted, then set aside for the milk to cool. When cool, add one well-beaten egg and a teaspoonful of salt. Put about half a pound of fine sifted flour into a large bowl, and stir the liquid into it, beating the mixture until it is a light batter; rub a yeast cake with one teaspoonful of cream until it is soft and smooth, then stir in two more spooniuls of cream, and one teaspoonful of sugar, add to the batter, thoroughly beating them together. When the mixture has been well beaten, cover the bowl with a cloth, and place where its contents will rise for three-quarters of an hour; by that time the batter should be light and spongy all through. Stand a griddle over the fire, and when hot put in the batter and bake in a hot oven.

Graham Crackers.

One cupful of sifted Graham flour, two-thirds of a cupful of white flour, two teaspoonfuls of sugar, a dust of salt, two even tablespoonfuls of cold butter rubbed through the flour and sugar. Mix with sufficient cold water to make a dough. Roll them, cut in small oblong and round shapes. Bake in a quick oven. They should be about as thick as ginger-snaps. They are very nice.

Soda Crackers.

One pound of sifted flour with the yolk of one egg; dissolve one teaspoonful of carbonate of soda in a little milk; add it and one teaspoonful of salt to the flour and as much milk as will make a stiff paste; work well together, beat for a few minutes with a rolling-pin and then roll it out very thin. Shape into squares and bake in a moderate oven until crisp.

A Good Iced Cake.

Whites of two eggs, yolks of three, the other white for frosting. Beat well. One and one-half cups of sugar, 1 cup of sour cream, 1 teaspoon of soda, 1 of baking powder, 1 teaspoon of vanilla, flour enough to beat nicely; bake in layers.

Frosting—One white of egg beaten stiff, 1 cup of sugar. Boil in some water till it is brittle, then add the beaten white and two tablespoonfuls of grated chocolate. This frosting is very good.

Sugar Biscuits.

Take butter and sugar of each one pound; six eggs, leaving out two whites; beat all this in a mortar for an hour or more; flavor with orange-flower water or lemon juice; then add gradually one pound of fine flour. Drop the paste, in small lumps, on paper or in patty pans, and bake quickly.

Walnut Cake.

Three eggs, one cup and a half of sugar, half a cup of butter, half a cup of milk, two and one-half cups of flour, one and one-half teaspoonfuls of baking powder, one cup of chopped walnuts.

French Chocolate Cake.

Take the weight of three eggs in flour, powdered sugar, butter and chocolate. Melt the butter in a stew-pan, and add the chocolate cut up into little pieces. When it is melted add by degrees the sugar, flour, yolk of eggs, and the whites, beaten to a stiff froth, stirring continually. Butter a mould, turn the mixture into it, and bake it for half-an-hour.

Soft Gingerbread.

One egg, one cup of sugar, one cup of molasses, one cup of lard, one cup of sour milk, four teaspoonfuls of soda, two tablespoonfuls of ginger, flour enough to make the dough as stiff as a cup-cake. Bake in a slow oven.

Sugar Cookies.

Cream a cupful of maple sugar, a half cupful of granulated sugar and one cupful of butter, then add three well-beaten eggs and a half cupful of sweet milk. Add two cupfuls of flour, or enough to make a stiff batter. Stir in two teaspoonfuls of baking powder and a teaspoonful of vanilla. Roll out a little at a time, adding flour as needed and making the shapes very thin. Place in a floured pan and bake a nice brown in a moderate oven.

Short Cake.

Sift one pint of flour, one teaspoonful of salt and four level teaspoonfuls of baking powder. Rub in lightly but thoroughly two rounding tablespoonfuls of butter. Pour in slowly three-quarters of a cupful of milk, cutting it in with a broad-bladed knife. Turn out on a board, knead a few times, shape with a round cutter, spread melted butter on top, and bake in a quick oven. If the dough is tucked in after cutting, there will be no "trimmings." Sometimes a little more milk is required. It is important to know the thickening quality of the flour used in order that the exact quantity of milk may be added at one time, as the biscuits are incomparably better when this is done. If a particularly dainty short cake is desired, use pastry flour.

Old-Fashioned Jumbles.

Half a pound of butter, nine ounces of flour, one teaspoonful of vanilla, half a pound of powdered sugar, two tablespoonfuls of lemon juice and three eggs. Beat the butter to a cream; add the

sugar gradually, beating until very light. Now beat the eggs all together, add the butter and sugar, the juice and vanilla, and then the flour, sifted. Beat the whole well. Drop in spoonfuls on a lightly buttered pan and bake in a moderate oven.

Ginger Snaps.

One cup sugar, one cup butter, one cup molasses, one tablespoon ginger, one-half teaspoon soda dissolved in one tablespoon cold water, flour. Bake in buttered tins.

Icing for Cakes.

The principal cause for icing breaking and falling off when the cake is cut is that the syrup has been boiled too long, making the icing too hard. Any of the following will be found good recipes:

Chocolate Icing.

Beat the whites of three eggs to a stiff froth; gradually add three teacups of white sugar. Beat very hard and add grated chocolate to suit the taste.

Tutti Frutti Frosting.

Boil one half a teacup of water with three cupfuls of white sugar till it is very thick and waxy. Beat the whites of two eggs to a stiff froth, and pour the syrup over them, beating till it is cool. Then add one half a pound of almonds, chopped fine, one small half teacupful of large raisins and a little citron, sliced thin. This is very nice for sponge cake.

Quick Frosting.

Break the whites of two eggs into a bowl, without beating; add one tablespoonful of corn starch and pulverized sugar enough to make it quite stiff. It will be dry in a few minutes.

Boiled Icing.

The white of one egg beaten to a stiff froth; one cupful of granulated sugar, and two tablespoonfuls of water. Boil the sugar and water until it hairs, then pour it slowly on the egg, and beat until the proper consistency to spread on the cake. Care should be taken not to allow the syrup to boil until the sugar is entirely dissolved. Any desired flavoring may be used.

Maple Sugar Icing.

Put a heaping cupful of pure maple sugar, broken into small pieces, into a saucepan with just enough boiling water to moisten it; set on the stove where it will boil rapidly, but not burn, for fifteen or twenty minutes. Have ready in a bowl the white of an egg beaten to a stiff froth. Pour the syrup slowly into this,

stirring it hard ; beat the mixture until stiff and cold. Beat up the yolk of the egg with a teaspoonful of milk and thin the filling with this, using as much of it as is necessary. When the cake is cold spread the layers between the cake.

To Set Icing.

To prevent the icing from running off of a cake, first sift a little flour over the cake, and then wipe it off with a soft cloth. You will find with this method, the icing, however thin, will remain and set easily.

Christmas Plum Pudding.

A pound and a half of raisins ; half a pound of currants ; half a pound of mixed peel ; three-fourths of a pound of bread crumbs ; three-fourths of a pound of suet ; eight eggs. Stone and cut the raisins in halves, but do not chop them ; wash, pick and dry the currants, and mince the suet finely ; cut the candied peel into thin slices, and grate down the bread into fine crumbs. When all these dry ingredients are prepared, mix them well together ; then moisten the mixture with the eggs, which should be well beaten ; stir well, that everything may be very thoroughly blended, and press the pudding into a buttered mould ; tie it down tightly with a flour-cloth, and boil for five or six hours. It may be boiled in a cloth without a mould, and will require the same time for cooking.

Custard Souffle.

Mix one-fourth cup of sugar, one cupful of flour and one cupful of cold milk, add it to one cupful of boiling milk and stir until it thickens : add three level tablespoonfuls of butter ; then add the yolks of four eggs, beaten ; when well mixed add the whites of the eggs, beaten stiff ; turn this into a buttered baking dish ; stand this in a pan of hot water and bake in a moderate oven thirty minutes ; serve as soon as baked with a creamy sauce.

Pumpkin Pudding.

Beat together half a quart of stewed pumpkin,—pressed through a sieve—five eggs, whites and yolks beaten separately, one quart of milk, half a teaspoonful each of mace, cinnamon, nutmeg, and three-quarters of a cupful of white, or very light brown sugar, pour into a pudding dish and bake.

Peach Pie.

Make a rich pastry of puff paste and line a deep porcelain dish. Fill with peeled and halved peaches, sweetened, and slightly stewed, if desired. With ripe peaches, however, this is hardly desirable. Drop in three or four cracked peach pits Cover with paste and

bake in a quick oven. When done break the top crust lightly with a fork and mix with the peaches. Sprinkle powdered sugar over the top and serve with rich cream.

Plain Lemon Pudding.

Make three-quarters of a pound of flour and six ounces of lard into a smooth paste with a little water, and roll it out to the thickness of about half an inch. Squeeze the juice of a large lemon into a cup, stir one teaspoonful of flour into it, and as much moist sugar as will make it into a stiff paste. Spread this mixture over the rolled-out paste, roll it up and fasten up the ends. Tie the pudding in a floured cloth and boil for two hours and a half. Serve with sweet sauce.

Apple Supper Dish.

Boil half a pint of good milk with lemon rind, beat the whites of two eggs to a stiff froth. When nice and firm, mix in a good tablespoonful of sugar and stir slowly. When the milk boils place the white of eggs in it, a spoonful at a time, and poach it, turning it at both sides. Then remove the froth and strain the whites. Place the poached whites on a layer of apple marmalade in a glass dish and pour some custard round, or whipped cream may be useful in stead of the whites of eggs.

Rice Mould.

Put five ounces of rice in a quart of milk, and simmer gently till the milk is absorbed. Flavor with lemon-peel or a little cinnamon, and sweeten. Pour into a mould that has been rinsed out with cold water. Leave till cold, loosen the edge, shake gently, and it will turn out easily. Serve with a custard poured round.

Apple and Tapioca Shape.

Put one ounce of tapioca to soak in half a pint of cold water. In the morning fill a pint mould with peeled and quartered apples. Add to the soaked tapioca two ounces of sugar and a little cinnamon. Pour over the apples, and simmer in a double saucepan for two hours, then pour into a mould. Serve cold, with custard flavored with lemon.

Small Cottage Puddings.

Sift two cups of flour with one-half cup of sugar and four level teaspoons of baking powder. Add two tablespoons of melted butter and one cup of milk and one beaten egg. Stir all the ingredients together and beat well for one minute. Bake in buttered warm gem pans or in muffin tins prepared in the same way. Serve with lemon pudding sauce.

Fig Pudding.

A quarter of a pound of bread crumbs, the same quantity of flour and finely chopped suet, and six ounces of chopped figs. Mix the dry ingredients well together, and then add two well-beaten eggs. Pour into a well-greased basin, and boil for three or four hours.

Cup Pudding for Invalids.

Soak half a teacupful of bread crumbs in milk and beat up light with a fork. Grease a cup with butter and add a lightly-beaten egg to the bread crumbs and sweeten very slightly. Pour the mixture in a cup and steam for twenty minutes.

Yorkshire Pudding.

Half a pound of flour, one pint of milk, two eggs, half a teaspoonful of salt, baking powder. Put into a basin the flour, salt, baking powder, and mix well. Beat up the eggs, add the milk to them, mixing thoroughly, then pour all gradually into the flour, stirring constantly to prevent the flour going into lumps. When this is well mixed, pour the pudding into a well-greased flat tin and bake for half an honr.

Currant Wheatlets.

Currant wheatlets for a light supper are delicious. Make a batter with one egg and a cupful of rolled oats, another cupful of self-raising flour a teaspoonful of salt, and milk enough to make all into a thick cream ; add as many washed currants as you please. Stir up and leave for an hour before using ; then rub a heated frying-pan with a morsel of beef fat, pour in sufficient batter to cover the bottom well ; fry on both sides, and serve the cakes with sifted sugar.

Hickorynut Cake.

Two cups sugar, two-thirds cup butter, one cup milk, three and one-eighth cups flour, three eggs, two teaspoonfuls baking powder, one cup nut meat. This will make two loaves.

Nut Filling for Cake.

One cup nut meats (any kind chopped fine), one small egg, three-fourths cup confectioner's sugar, one-half cup sour cream, vanilla. This is especially good made with hickory, butternut, or walnut, meats.

Iced Chocolate.

Dissolve a pound of sweet chocolate in a quart of water with half a bean of vanilla; when cold, stir in a quart of cream, then strain through a fine sieve. Put it into a freezer with lightly salted ice around. Serve in glasses.

Iced Coffee in Sherbet.

Have one quart of black coffee mixed with one quart of cream and twelve ounces of sugar; place it in a freezer with salted ice around, detach from the sides as fast as the ice adheres, and when sufficiently cold and firm serve in glasses,

Raspberry Cream Ice.

Stem and mash a quart and a pint of raspberries; add to them ½ lb. of sugar and the juice of one lemon; stir until the sugar is dissolved. Cover and stand aside until you prepare the cream. Put a pint of cream in a double boiler, add another half pound of sugar and stir until sugar is dissolved. Take the mixture from the fire and when cold add another pint of cream. Freeze until the consistency of a thick batter. Remove the lid carefully and stir in the raspberries; readjust the lid and crank, and turn slowly until the mixture becomes hard and dry. Remove the dasher and re-pack.

Currant Ice.

To prepare it, soak a tablespoonful of gelatine for half an hour in an eighth of a cup of cold water. Pour over it a half pint of boiling water, add a pint of currant juice, a scant pint of cold water a pound of granulated sugar and the juice of a lemon. Freeze and pack.

Economical Ice Cream.

Three quarts of milk, three pints of cream, two eggs, two cupfuls of sugar, two tablespoonfuls of flour, not cornstarch. Beat whites and yolks of eggs together, add one quart of the milk and cook in the double boiler. When hot, add the sugar with which the flour has been well mixed. Let cook twenty minutes, stirring steadily, so that it will be quite smooth. Cool, add the remainder of the milk, the cream, flavour and freeze. This is more work than if made from clear cream, but it is as good, costs less, keeps better and makes six quarts.

Molasses Walnut Candy.

Boil a quart of molasses for half an hour, then add a saltspoonful of baking soda and boil until a little dropped in cold water becomes brittle. Stir in shelled and halved walnuts and pour into a greased pan.

THE FAMILY DOCTOR.

Typhoid Fever.

Typhoid fever is the disease which, under the name of enteric fever, caused such enormous losses in the South African war and in the Spanish-American war. Impure water or milk supply is the most common cause. Depressing influences, such as anxiety, home sickness or great fatigue seem to occasion it in some instances. The discharges of the patient also will, if not disinfected, impart the disease, and wells that have been contaminated are a source of widespread contagion. The age at which typhoid fever is most apt to occur is between fifteen and thirty years, rarely before ten, and still more rarely after fifty. The appearance of the disease does not seem to be influenced by climate or locality.

Typhoid fever is usually preceded for several days by headache, loss of appetite and strength. Bleeding from the nose is often an early symptom, so also is a slight cough. Increasing weakness and the coming on of fever force the patient to take to his bed. Considerable fever and thirst are then complained of. The nights are wakeful and delirious; the days are passed in dozing and muttering. Soon toward the close of the first week the abdomen swells, and diarrhœa ordinarily sets in about the same time. The face takes on a dull look, and a dark purple flush. About the beginning of the second week, a few small rose-colored spots, which are peculiar to the disease, show themselves on the body; they disappear for a moment when pressed upon by the finger, but quickly return after the pressure is removed.

Recovery may begin at the end of the second week, but ordinarily not before the fourth week, while the attack, in rare cases, lasts two or three months. Great wasting of the body and troublesome bedsores accompany protracted cases. The patient gets well very slowly, and is liable, for a long time, to a relapse. About one case in twenty ends fatally, death taking place usually in the neighbourhood of the eighteenth or twentieth day.

Good nursing is of more consequence than medicine in typhoid fever, as there is no remedy known which will cut the disease short. At the outset, if the bowels are costive, a teaspoonful of castor oil, or a dessertspoonful of the effervescing citrate of magnesia may be given in water. When the diarrhœa becomes excessive,

half a wineglass of limewater mixed with an equal quantity of milk, is an excellent soothing drink. Headache is best relieved by cutting the hair short and applying iced cloths or pounded ice enclosed in a rubber bag. To allay the heat of the skin, sponge the body with ice-cold water, or vinegar and water, care being taken to expose to the air only one part at a time. If much pain and tenderness of the bowels be complained of, apply a large hot mush poultice. Great attention must be paid to preventing bed-sores by keeping the bedclothes always smooth, by frequently changing the position of the patient, and by bathing the parts most pressed upon with whiskey, and rubbing on a little zinc oxide powder.

The diet is of utmost importance in the treatment of typhoid fever. Neither during the sickness, nor for a long time after recovery, should solid food be given. Although fluid, the diet must be supporting. The quantity given at a time must be small, not much more than a wineglass, so as not to distend the stomach, but it is to be repeated frequently, every hour or two. An excellent diet is a wineglass of milk, to which a tablespoonful of lime water is added, given every two hours, and in the alternate hours, a wineglass of beef tea. Iced lemonade or ice water may be taken to quench the thirst, but not more than a wineglass at one time.

As to medicines, few are required. A laxative may be given at the outset of the disease, as already mentioned. When the patient begins to show great weakness a pill of one-fortieth of a grain of strychnine four times a day is very useful, and frequently it is necessary to sustain the strength by alcohol given in the form of one dessert to one tablespoonful of best whiskey in a wineglass of water. A five-grain powder of phenacetine four or five times a day is a good remedy to reduce the fever instead of the sponging. If instead of diarrhœa constipation should occur, give an injection of one pint of soapsuds, or a glycerine suppository.

Smallpox.

Smallpox is an eruptive febrile disease. It results from specific contagion, and is communicated by contact, or through the air. There is no disease of which the contagion is so sure, and which operates at a greater distance, than that of small-pox ; but it rarely attacks the same individual more than once. The poison begins to manifest itself about twelve days after its absorption. Small-pox occurring in persons unprotected by vaccination is fatal on the average to one in every three ; whilst in those attacked after efficient vaccination the mortality is very small, probably not more than two or three per cent.

The disease usually commences with severe pain in the back

and loins, great prostration, followed by heat and dryness of the skin, a hard and frequent pulse, loss of appetite, pain in the upper part of the abdomen, with nausea, vomiting, headache, and sometimes delerium or convulsions. About the third day, an eruption of small hard red-coloured pimples makes its appearance about the face and neck, and gradually extends over the trunk and extremities. The pimples gradually ripen into pustules, which, on the eighth day, generally begin to break, and crusts or scabs form, these last falling off in four or five days more. The severity of the disease varies much in different instances, but is almost always in direct relation to the quantity of the eruption. When the pustules are numerous, they run together, and form an irregular outline; when fewer, they are distinct, and of a regularly circumscribed circular form. In the former variety of the disease, known as confluent smallpox, the patient is never free from danger, while the latter is seldom or ever dangerous. The most important difference between the two forms is the secondary fever, which sets in about the eighth day of the eruption, or just when the maturation of the pustules is complete. It is slightly marked in the distinct smallpox, but generally very intense and perilous in most instances of the confluent, being the period at which death oftenest occurs. Both kinds are accompanied by sore throat, salivation, and frequently diarrhœa. A peculiar disagreeable odour also usually proceeds from the body of the patient. The treatment required in smallpox does not differ particularly from that of ordinary fever, the bowels requiring to be kept moderately open, free ventilation established, and the skin, if necessary, kept cool by sponging it with tepid vinegar and water. Small doses of mercury are often serviceable in moderating the febrile symptoms. The strength requires to be attended to, and, if much reduced, quinine, wine, and nourishing diet are to be administered. The complications of this disease require to be carefully watched; and if the throat be much affected, a blister should be applied to the neck, and gargles of infusion of roses used. To relieve the intolerable itching the pustules may be smeared with cold cream, and after they have burst some dry powder should be dusted over them to absorb the matter.

Vaccination.

Vaccination, as the term is commonly employed, is inoculation with the virus of cowpox as a preventive of smallpox. Cowpox, or vaccinia, is an eruptive disease of the cow, and the virus when inoculated into human beings produces a local pock with constitutional disturbances which affords protection, more or less permanent, from smallpox.

The operation of vaccination is a comparatively simple one. The vaccine is supplied from the vaccine farms either on a small ivory point or enclosed in a fine glass tube sealed at both ends. The part usually vaccinated is the outside of the upper arm, just below the shoulder. This should be well scrubbed with soap and water, the soap thoroughly removed by washing with clean water, and the skin dried. As a rule antiseptics are not required, and, if used, all traces must be washed away with water that has been boiled, as any remnant of the antiseptic would prevent the innoculation taking. With an ordinary needle or with the vaccine point itself, four vertical and four transverse scratches are made close together on the skin, and just deep enough to get a pinkish or reddish tinge. It is not advantageous to draw blood. After the skin is scratched, both sides of the vaccine point are rubbed on the place made ready for it. The spot is left uncovered until it dries, this being known by its having a glazed appearance.

In a first vaccination, after from one to seven days, a little red pimple is seen. In five or six days more there is a distinct vesicle, and at the eighth day this is at its greatest size and filled with a clear serum. By the tenth day it is filled with pus, and the skin around is red, swollen and tender. Then follows a brownish scab, which dries up and separates in about another week, leaving a pitted scar. When the scar is at its worst there is a certain amount of fever and restlessness, usually not very severe. The glands in the armpit sometimes become sore. If the irritation is very great it can be relieved by laying over the red area a piece of linen wet with a solution of baking soda. Babies, if well, should be vaccinated at about three months old. Re-vaccination should be done between the tenth and fifteenth years, and whenever there is any danger of smallpox. The practice of vaccinating from the pock on a person's arm is to be discouraged as much as possible, as by that means other diseases may be spread.

Chicken-pox.

Chicken-pox is an acute infectious disease entirely distinct from smallpox. It is usually very mild, with slight fever and malaise, and accompanied by a rash. This begins as little red papules, which change to watery blisters, then this clear serum changes to pus, the thin covering breaks, and a scab forms and dries up. The eruption comes out in successive crops, so that in about four days all stages, papule, blister, pustules and scab can be seen on different parts of the body. Little treatment is required. The patient should be kept in bed and given a light diet, and a little oil or vaseline should be applied to lessen the itchiness. Little ones must not be allowed to scratch the spots, as, especially on the face, permanent scars may result.

Diphtheria.

Diphtheria is a very malignant disease of the throat. It is characterized by a peculiar inflammation of the mucous membrane of the throat, accompanied by the production of a false membrane. At first this membrane appears in the form of a white spot on the throat or tonsils, from which it gradually extends forwards to the soft palate and into the nostrils, and backwards into the œsophagus, sometimes into the larynx, but seldom into the trachea, producing at length suffocation. It is usually accompanied by a fœtid discharge from the nose and mouth, and hæmorrhage frequently occurs. There is usually, also, a low and dangerous form of fever, with great depression of spirits and rapid decrease of the patient's strength, which is still further accelerated by his inability to take food.

Diphtheria of the larynx, also called membranous croup, is a very dangerous type of the disease. In it, the membrane fills up the breathing space, causing suffocation. The voice is first hoarse, then reduced to a whisper, the cough is rough, and the breathing loud and difficult. In such severe cases the only hope of relief is by intubation, that is, insertion of a tube between the vocal cords, or by tracheotomy, that is, cutting an opening into the wind-pipe below the larynx.

There is no form of diphtheria, however mild in appearance, that is not unattended with danger, but fortunately the disease is not dreaded now so much as before the introduction of the diphtheria anti-toxin. This, if used early and given freely, is a certain cure for the disease, and it has no bad effects except occasional temporary skin rashes. If detected the first day of the illness, 1000 to 2000 units are sufficient. Later 3000 units are required and must be repeated if necessary. In the laryngeal type large doses must be given. The anti-toxin is injected into the loose tissue beneath the skin of the back, causing a small lump, which soon disappears as the serum is absorbed. Within twelve hours there is improvement in the condition, and within twenty-four hours the patient is better.

Scarlet Fever.

Scarlet fever, or scarlatina, is a contagious febrile disease, almost always attended during a part of its course by a rash and by sore throat. Sometimes only one of these features is well marked, sometimes both. Though persons of all ages are susceptible of it, it is eminently a disease of children and rarely attacks a person more than once. It usually comes on with shivering, headache, nausea and vomiting, or in children with convulsions. Then generally on the second day the eruption begins to come out. In the most regular and favourable cases, the eruption stands out

for three or four days, and then begins to fade and decline, becoming, by degrees, indistinct, and disappearing altogether in the majority of instances before the end of the seventh day. The tongue is often covered at the outset with a thick, white, cream-coloured fur, which gradually clears away, and the surface becomes unnaturally red and raw looking. There is a sensation of stiffness and pain on moving the neck, with pain and swelling; the voice is thick, and the throat feels rough and straightened. In treating the simplest form of scarlet fever, little else is required than confinement to bed, regulation of the bowels, and the avoidance of all stimulating substances in the matter of diet. If the heat of the surface is great and distressing, cold or tepid sponging may be adopted. If delirium comes on, the scalp may require to be shaved and cold applied to it. In the worst form of this disease, all efforts to save the patient will often be unavailing. When the system seems to be overwhelmed with the strength of the poison, a liberal administration of wine will be required to sustain the flagging powers until the deadly agency has in some measure passed away. As gargles for the throat, a weak solution of common salt is very useful. The bowels also require to be carefully watched; and great care is necessary to avoid cold during the period of convalescence.

Measles.

Measles is a contagious fever of an inflammatory type, attended with a characteristic eruption, and all the symptoms of a violent cold; watery discharge from the eyes and nose, dry cough, hoarseness, &c. It commences with the ordinary symptoms of fever,—chilliness, loss of appetite, lassitude, and is almost invariably attended with inflammation of the mucous membrane lining the air passages. The eruption commonly appears on the fourth day, at first about the head and neck, then the trunk and arms, and finally reaching the lower extremities. It consists of little papules, somewhat resembling flea-bites, of a dark-red colour. It takes two or three days to complete its course, and when it reaches the feet and legs it has usually begun to disappear from the face. At the end of six or seven days from its first appearance, the eruption has entirely disappeared. When the eruption is fully out, the cough, at first dry and troublesome, generally becomes softer and less frequent. All ages are liable to attack, though infants at the breast are not so liable as those somewhat older.

Measles is not commonly a dangerous disease, though sometimes it has proved exceedingly fatal. Where danger occurs, it is from inflammation of the air-passages, when the disease may become complicated with croup; or in subjects predisposed to consumption, the seeds of that disease may be developed. In

general, a simple diet and the maintenance of an equable temperature is almost all that is required. Sometimes the application of a poultice to the chest is of advantage. During the height of the fever the following is a good medicine for the little ones to take: Acetate of potash, two drachms; aromatic spirits of ammonia, two drachms; syrup of orange, two ounces; water, to four ounces. Mix, and give one-half to one teaspoonful in a teaspoonful of water every three hours. After the disease has subsided the patient should receive nourishing and easily digested food and tonics, be kept warmly clad, and not allowed to go out of doors too soon.

Mumps.

Mumps is an inflammation of the parotid and submaxillary glands of a contagious or epidemic origin. It is generally preceded and accompanied by some degree of fever, and commences with a feeling of pain and tension beneath the ear; a swelling forms, and the motion of the jaw becomes painful. It usually attains its height in four days, and four days more are occupied by its decline.

It ordinarily requires little treatment, beyond the administration of a laxative and protection from cold, with the application to the part of poultices or other warm substances or, in severe cases, of leeches.

Whooping Cough.

Whooping-cough is a contagious disease, especially of children, marked by violent coughing, ending with a whoop. The symptoms commence with a cough closely resembling that developed in a common cold, but at the end of about one or two weeks the character of the affection changes. The fits of coughing become longer and more frequent; a sensation of tickling accompanies each fit, during which the inspirations are irregular, especially in the case of children, whose faces bear an expression of anxiety and fear. When the fit comes on, they cling firmly to the persons or objects near, and, if asleep, start up. The efforts of coughing then become so rapid and violent as to take away the breath; during the intervals between it is difficult to perceive any inspiratory movements, excepting at times when the cough is interrupted by the peculiar whooping sound which has given this disease its common name.

Hitherto no treatment of whooping-cough has been discovered by which its progress can be arrested. It must, necessarily, run a certain course, which often, in spite of skilful treatment, may be long. Ordinarily, it continues from six weeks to three months, but sometimes it may last for six months, or even longer. Mild sedative expectorants may be given, as tincture of squills and

camphorated tincture of opium ; but as a rule, unless complicated with other diseases of the chest or head, little medical treatment is required. The patient should be kept in a constant temperature of 65 degrees, and the bowels kept moderately open. The diet should always be of the mildest description at the commencement, but afterwards it may be of advantage to adopt a more tonic and nourishing regimen. In protracted cases nothing appears to be so effective in putting a stop to the cough as change of air, which frequently succeeds when all other methods have failed.

Grippe or Influenza.

Grippe, or influenza, is an epidemic febrile catarrh, differing from a common catarrh in the greater severity of its symptoms. It comes on suddenly, attacking many persons at once ; but though the symptoms are alarming, it is seldom fatal, except to the aged, or those of weakly constitution. The person is first seized with slight chills ; there is great heaviness and pain over the eyes, great prostration of strength, loss of appetite, quick, irregular pulse, cough, and difficulty of breathing, with running at the nose and eyes. The duration of the disease varies from two or three days to as many weeks ; and frequently the debility continues much longer, occasioning, not uncommonly, relapses. It is now known to be caused by a specific germ, but weather changes assist greatly in its spread.

In its treatment, little is required to be done beyond keeping the patient in bed, in a warm and equable temperature, and the administration of aperient and cooling medicines. When the difficulty of breathing is considerable, a mustard poultice may be applied to the chest. When the fever has subsided, tonics and stimulants should be employed ; and should the cough remain obstinate, change of air will generally be found to be the most effectual means of removing it.

It is specially dangerous to old people because of its weakening effects and because of the danger of being followed by pneumonia. In such cases strict confinement to bed is necessary for some days after the more acute symptoms have passed away.

Fever and Ague or Malarial Fever.

Fever and ague, or malarial fever, is an infectious disease caused by the presence of a minute organism in the blood. This organism, like the germ of yellow fever, is introduced into the system by a mosquito, increases rapidly in numbers and causes the chills and fever. The attack comes on with a severe chill lasting one to four hours, then gradually the chilliness passes off and intense fever follows, and in about twelve hours this disappears with profuse sweating, and then usually the patient is free until the second day after, when the attack is repeated. When these

attacks last long the general health is much weakened, the liver, and especially the spleen, are enlarged, and a condition of more or less chronic malaria results.

The treatment consists in giving large doses of quinine, which acts as a direct poison to the organism. Two drachms should be given in divided doses in the intervals between the attacks. To relieve the chill quickly, the bed covering should be heaped on and hot water bottles applied. The fever may be eased by cold sponging or a cold bath. As soon as the malaria is disappearing, tonics, good food and fresh air are required.

Tuberculosis.

Tuberculosis is an infectious disease caused by the tubercle bacillus and characterized by the formation of little nodules or tubercles which may break down and ulcerate or may harden and form scar tissue. It is found among animals, especially cattle, from which it may spread to man. It exists in all countries, among all races of mankind, and at all ages of life. It is commonly called the white plague, but negroes and Indians are more liable to it than whites.

Infection occurs most frequently through the air. The bacilli when dry, float in the atmosphere and are inhaled with the breath, so that most primary lesions are in the respiratory passages. Infection may also occur through milk food or inoculation.

Any part of the body may be attacked. The most frequent situation is the lungs, producing phthisis or consumption. The lymphatic glands are affected frequently, producing abscesses, which are very slow in healing and leave large scars. Bones and joints may be diseased, causing curvature of the spine, hip-joint disease, white swelling of the knee, etc. In children or young adults we may have tubercular meningitis, indeed any organ or tissue may be affected, those above being the most usual sites.

Pulmonary Tuberculosis, Phthisis or Consumption.

This is the dread disease, to combat which so much work is being done at the present time. Its one main cause is the inhalation of the tubercle bacilli into the air cells. There they increase in number, setting up a more or less chronic inflammation of the lungs. In addition to the germ, other factors have much to do with the spread of consumption. Dirt, poor ventilation, crowded

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rooms, lack of sufficient food, attacks of other diseases—as measles, whooping-cough, typhoid fever—all tend to give the germ an opportunity to live and spread.

The great difficulty with this infectious disease is that its onset is insidious. With other infectious diseases, such as measles, scarlet fever, typhoid fever, etc., the patient is very ill at the beginning and warning is at once given that the condition is dangerous to the patient and others. With consumption it is not so. The patient may have what he thinks is a slight cold, or he is getting thin, and has a poor appetite, but often there is little or nothing to point to the particular illness. After a time, however, more marked symptoms prevail, with cough, expectoration, loss in weight, feverishness in the afternoon, night sweats, and general weakness. When the chest is examined one part is found not to move as it should, and when the breathing is listened to carefully, there are little whistling or clicking sounds which should not be there.

The treatment consists of rest, fresh air, plenty of good nourishing food, with medicines playing only a secondary part. The results of treatment are generally good in cases that are taken early and given proper surroundings. In most cases these surroundings can be best obtained in a sanatorium, and these are but too few in number as yet. The most important point in the management of a case of consumption is to prevent its spread to others, and this is done by destroying the source of infection. The bacilli are contained in millions in the sputum, and if this is allowed to dry, they are carried everywhere by the currents of air. To prevent this the sputum should be collected in little pasteboard cups, and these burnt in the stove two or three times a day. The lips may be wiped with some gauze or linen moistened with an antiseptic solution, such as of boracic or carbolic acid, and these swabs burnt also. After removal of the patient, the walls, flooring and furniture must be disinfected. In doing this, as much as possible should be burnt and anything else that can be should be put into a boiler and boiled for half an hour. The immovables must be washed with a strong solution of corrosive sublimate, and abundance of fresh air and sunlight should be allowed in the room.

Erysipelas.

Erysipelas is an acute contagious disease caused by a specific germ. Its chief symptom is a peculiar spreading inflammation of the skin, which is accompanied by fever, headache, and general ill-feeling. The fever is preceded by a chill, sometimes slight, but often very severe. In ordinary simple cases the inflammation attacks only the surface of the skin, but in severe cases the deeper structures are attacked.

Although erysipelas is one of the contagious diseases, it is not one to be much feared by persons in robust health ; great care should be taken to shield from this contagion all those who have recently undergone surgical operations, as they are peculiarly susceptible to its poison, and it is one of the most usual causes of blood-poisoning and wound-infection.

An erysipelas patient should be strictly isolated, and all dressings or articles which have come in contact with him should be disinfected or burned. The sick-room should be disinfected and fumigated before it is occupied by others. Any one nursing such a case should be scrupulously careful not to go near a person who has undergone an operation or who has an open wound of any kind.

In the treatment, everything must be done to maintain perfect hygienic conditions round the patient. There must be an abundance of fresh air and sunshine, pure water and scrupulous cleanliness in every direction. Much relief is afforded locally by compresses dipped in some cooling lotion, such as a solution of a teaspoonful of sugar of lead in a pint of water, and applied to the inflamed surface, and there are many other alleviations which can be indicated only by the physician in charge of the individual case, as the symptoms call for them.

After a prolonged attack of erysipelas convalescence is apt to be slow, and an enfeebled condition may persist for a long time. The treatment at this stage should be tonic and supporting, and great care should be taken to avoid undue fatigue.

Hydrophobia.

Few accidents are more terrifying to the sufferer than to be bitten by a dog supposed to be mad, and there are few conditions in which prompt and intelligent action on the part of the bystanders is more desirable.

Although nearly all warm-blooded animals are susceptible to rabies, it is most commonly seen in dogs. There are two forms, the "furious" and the "dumb." In the furious type, after a period of melancholy or depression, the animal becomes restless and irritable, with a tendency to run away and snap at everything in sight, finally becoming subdued and sullen, and dying of paralysis and exhaustion. In dumb rabies the stage of irritability is absent ; the dog prowls about in a listless way with his head down and lower jaw dropped. At the same time there is difficulty in swallowing.

It is often impossible to tell from a dog's actions whether it is rabid or not ; but if instead of killing the animal as quickly as possible, as is often unwisely done, the owner capture it and keep it for a few days under lock and key, the question answers itself. A rabid dog always dies in from four to eight days, so that if the animal recovers, the bitten persons may be sure that they are not going to develop hydrophobia.

In any suspicious case the wound should immediately be squeezed under hot water, and if deep, be incised freely, so that cauterization with either a hot iron or with strong nitric acid (not with lunar caustic) may be thoroughly done. At the same time the dog should be kept under observation, or if already killed, the head and neck should be packed in ice, and preserved for medical examination.

Even if it seems certain that the animal was rabid, the patient should not dispair, for it is estimated that only fifteen per cent. of those bitten by rabid animals actually develop the disease, and if the Pasteur preventive inoculations are promptly begun, recovery is almost certain.

Acute Rheumatism.

Acute rheumatism, also known as rheumatic fever and inflamatory rheumatism, is both a painful and dangerous disease, not only in itself, but in its consequences. It is almost in every instance brought on by a chill, from wet clothes or damp sheets or exposure after perspiration. Certain persons are much more liable to it than others, so that there is some amount of hereditary predisposition to it. The chill seems to set up some change in the tissues by which lactic acid is left in too large evidence in the circulation ; and it would appear that that material has an intensely irritating effect on all fibrous tissue membranes, as in joints and between muscles.

The symptoms develop rapidly. Pains and stiffness are first felt over the body, but soon settle in particular joints. This is accompanied by feverishness more or less, with all its signs. The pains in the joints, usually in several at the same time, become intense, and the patient lies helpless, bathed in acid sweat. The joints are swollen from fluid within them, red, and exquisitely tender to the touch. But this is not the worst. There is a very common tendency for the rheumatic poison to attack both the inner lining membrane of the heart (endocarditis) and the outer (pericarditis), which too often is the begininng of serious and fatal heart trouble. At the outset this is not easily detected, even by a doctor ; but sooner or later the signs become apparent, especially murmurs heard by means of the stethoscope. The pains generally shift from joint to joint, till almost every joint in the body has been visited. The attack usually lasts from a month to six weeks.

The only effective treatment is salicylate of soda, given in fifteen-grain doses every hour at first for six or eight hours, and then every three hours. If the pains are thus well abated, it can be gradually given less frequently, as it is rather depressing. The patient should lie between blankets, and from the sour sweat being so copious the sheets should be frequently changed and aired.

He needs to be judiciously and carefully nursed owing to pain and helplessness. The painful joints should be bathed with a hot solution of bicarbonate of soda, painted with belladonna liniment, and covered with cotton wool. Small fly blisters are not uncommonly required if the joints continue swollen and painful. To relieve thirst, drinks of soda water, or milk and soda water should be allowed. The diet must be mostly milk, and this even diluted somewhat with soda water or barley water. As improvement sets in, broth may be added, and finally light, solid food. A tonic of quinine and iron will be required to establish strength.

Chronic Rheumatism.

The term rheumatism has been, and is yet so loosely employed, not only by the general public, but by physicians themselves, that it is impossible to determine just what is meant by it. Almost any painful affection of the muscles or joints, whether acute or chronic, is popularly termed rheumatism. Certainly two or three distinct diseases, and perhaps more, are thus confused, but there seems to be one painful affection of the muscles and joints, chronic in character, and not producing distortion of the limbs, which is distinct from the other rheumatic troubles, and which is called chronic rheumatism.

The trouble may come on after one or several attacks of acute inflammatory rheumatism, the last of these never entirely disappearing ; more or less pain, stiffness, and swelling persist in one or more of the joints. Or the disease may come on gradually without any preceding attacks of the acute inflammatory variety. This is the more common way. A tendency to suffer from this kind of rheumatism seems not infrequently to be inherited, for it is seen to run in families. Exposure to cold and wet is a common source of the disease. Only one or at most two or three of the joints are usually affected, and the changes in these are not very noticeable. The chief symptoms are pain, especially on attempted motion, and stiffness of the joint. Pressure, particularly at certain points, causes pain. Sometimes manipulation of the joint will give rise to a grating or cracking noise. There may be some swelling of the affected joint, but this is seldom very marked, and it is sometimes only simulated because of the wasting of the surrounding muscles.

If proper treatment is not prompt and persistent, there is danger of fibrous adhesions forming, which result in a permanently stiffened joint, or one which can be loosened only by an operation of considerable gravity.

A strange peculiarity of chronic rheumatism in its early stages before adhesions have formed, is that, although pain is at first

increased by motion, both pain and stiffness may be made to disappear by persistent and methodical movement of the joints. This indicates one of the best modes of treatment, namely massage and passive motion. Sometimes much relief is obtained by exposure of the joint to a very high temperature in an apparatus designed for the purpose. Hot baths, electricity, blistering and painting with iodine are also of value. Drugs are of limited service in most cases. Residence in a dry warm climate is often curative.

Muscular Rheumatism: Lumbago.

The commonest and most troublesome form of this malady is that in which the large mass of muscles in the lower part of the back is affected, this being usually termed lumbago. Another form is wry-neck, while in other cases it affects muscles in different parts of the body with greater or less severity.

The cause is usually exposure to cold, draughts, getting wet, or some sudden chill, especially when overheated. The affection is characterized by severe pain with the slightest movement, but with only a dull ache when perfectly at rest. In the case of lumbago the onset is sudden. The person is stooping to tie the shoe laces or pick up some article, when all at once a violent pain arises in the back, and it is almost impossible to straighten up, and afterward, with the slightest attempt at movement, the back is gripped as if in a vice.

Once lumbago has really arrived, the line of treatment calculated to afford the speediest relief is absolute rest and warm applications. When the first twinge has announced "what's what," the victim should make tracks for his bed via a hot bath or a Turkish bath. And in bed he should remain until the worst is past. Hot water bottles to back and feet, and a smart aperient (say a seidlitz powder) are advisable. Should the pain be excruciating, a good poultice—three parts linseed, one part mustard—applied as hot as it can be borne over the seat of the ache will hasten recovery. Later, or at once in less severe attacks, the back muscles benefit by a brisk kneading and rubbing. This may be carried out at least thrice daily. Between times, a broad bandage of new flannel may be pinned firmly around the body. Also take internally ten grains of iodide of potassium in a tumblerful of water three times a day.

In the matter of diet, it is better to stick to sloppy food, gruel, porridge, milk pudding, milk, buttermilk, and the like. The man who has suffered from lumbago and would fain learn how to escape it for the future, should go in for gentle but regular exercise, and he ought to devote ten minutes or so, once or twice daily, to gymnastics specially calculated to bring into play his back-muscles. Standing erect with hands outstretched above his

head, he may bend to attempt to touch his toes. Or he may lay his hands flat against the sides of his thighs, and sway at the waist from side to side, making the hands rise and fall alternately. Both exercises are to be done and repeated about twenty times.

Diabetes.

Diabetes is a constitutional disease characterized by a large appetite, great capacity for liquids, with gradually increasing weakness and emaciation. The amount of urine passed is greatly increased ; it is very heavy, and when examined is found to contain sugar, this being the main diagnostic point in the disease. In children it occurs rarely, but then runs its course very rapidly, in a few weeks or months. In young adults it lasts about a year, while in persons beyond forty years of age under proper care it can be kept under control and not cause death at all. When not treated, the patient gradually becomes thinner, pruritus, boils, and even consumption are likely to occur, and the end usually comes with coma or an attack of convulsions. In the treatment of diabetes the chief reliance of the physician is on the adjustment of the diet, looking to the exclusion, so far as may be possible, of all sugar-containing foods. At the same time care has to be taken to avoid the starvation of the patient in so doing. Many of the saccharine foods, those made up chiefly of starch, for example, are very nourishing, and their exclusion from the dietary exposes the patient to the dangers of insufficient nutrition. The main reliance of the diabetic in the way of food must be on meats, fats, green vegetables and nuts. He should take milk sparingly, avoid fruits, especially dried and preserved fruit, indulge in moderation in new potatoes (which are less starchy than is popularly believed) and omit almost absolutely bread, puddings, pies, and everything made from flour. Fats (cream, olive-oil and butter) are of special value, and the sufferer from diabetes should get himself into the habit of buttering lavishly everything he eats.

In the way of drinks, he may take tea, coffee or cocoa (without sugar of course), and water, but none of the flavoured waters, such as bottled lemonade and ginger-ale, which are always sweetened.

Anæmia.

Anæmia is a condition of poverty of the blood ; the number of the minute corpuscles of the blood is lessened, and the quantity of red colouring matter they contain is also diminished. It occurs in all wasting disease, and after prolonged attacks of acute illness, but in these cases it is only one symptom, and that a minor one, in the course of another disease. It also occurs as a primary disease. This is met with chiefly in young girls of fifteen to twenty-two, especially when in unsanitary surroundings. The

patient is very pale, lips, gums and eyes are colourless, there is weakness and indigestion, and very commonly constipation. When the blood is examined it is found to contain perhaps only half the amount of colouring matter that should be present. With treatment, recovery is usually comparatively rapid. The main remedy is iron in some form. It may be given as the tincture, five to ten drops mixed with glycerine and diluted with water, or some pills may be used. Blaud's five-grain iron pills (pills of the protocarbonate of iron of the British pharmacopœia) are very convenient and one or two may be given three times a day after meals. At the same time it is necessary to see that the bowels move regularly, for which purpose pills of aloin, strychnine, belladonna and ipecac, or the liquid kasagra, may be given. Ordinary Epsom salts in small doses on arising are also beneficial in these cases. The diet should be generous and should specially include red meats.

Quinsy, Pharyngitis, Tonsilitis.

Pharyngitis and tonsilitis, both of which are commonly known as quinsy, do not differ materially from each other either in character or in the mode of treatment ; but in the one case the pharynx is the principal or sole seat of the disease, in the other, the tonsils. The inflammation is brought on by cold, and it usually commences with cold chills and other febrile symptoms. There is fulness, heat, and dryness of the throat, with a hoarse voice, difficulty of swallowing, and shooting pains towards the ear. The inflammation may be confined to the pharynx, or it may spread from it over the soft palate and the tonsils, and into the cavities of the nose. On examination, the back of the mouth and fauces will be found unnaturally red and swollen, and often covered with a tough mucus.

In general, a common sore throat does not require much treatment, the inhaling of the vapour of hot water, or a large poultice round the throat, with gentle purgatives, and the avoidance of stimulating food, being usually all that is necessary for its removal. Frequently, however, the swelling continues for some time, and occasionally the disease takes the form of relaxed sore throat, which requires to be treated with stimulating gargles, as very diluted mineral acids, and tonics, if the general health be not good. In more severe cases, the difficulty of swallowing is much increased, and to avoid the pain the patient usually allows the saliva to flow from his mouth, and liquids attempted to be swallowed return through the nose. The inflammation may also extend to the Eustachian tube, producing deafness, and to the parts around the larynx, occasioning difficulty of breathing. With these symptoms there is usually a considerable degree of fever, with headache, loss of appe-

tite, &c. In such cases, strong purgatives are required, with a blister outside the throat, and warm poultices, the inhaling the steam of hot water, stimulating gargles, and if the throat be much swollen, leeches applied to the sides. A very useful remedy is the following. Tineture of iron, six drachms ; glycerine, one ounce and a half ; water, to four ounces. Mix. Use one-half teaspoonful in a wine glass of hot water as a gargle every two to four hours. Sometimes an abcess is formed in one or both tonsils, from which the patient suffers greatly. This will in time burst ; but it will materially shorten the patient's sufferings if it be opened as soon as the matter is distinctly formed. After the inflammatory symptoms have subsided a generous diet and tonics are necessary.

Acute Indigestion

The cause of most indigestion is less in the stomach itself than in the mouth. The stomach is but one of the digestive organs, and can and will do only the task that properly belongs to it. It cannot take raw material and work it into such shape that it is ready to be taken up by the absorbent vessels and carried to the tissues for the nourishment of the body ; consequently raw material, that is, material not properly chewed, must not be put into it.

The cause of practically every case of acute indigestion is overeating, such as even the most abstemious are likely to indulge in occasionally, as on Thanksgiving or Christmas day. This may be a very serious matter if the heart is diseased, but it is not generally of much moment in the young and healthy. The food is taken in too great quantity and too rapidly, without being properly chewed. There is more or less distress ; the little glutton (or perhaps the big one) feels heavy, maybe a little sick at the stomach, and wonders if he will ever care for mince pie again. In the meanwhile the stomach is struggling with its load, and despairing of ever digesting it, tries to get rid of it by pushing it on into the intestine. If it succeeds the burden is shifted to the intestine. If it fails it may expel the contents by vomiting. But even then some irritating material usually remains and sets up a fermentation, which is called a bilious attack.

The best way of cutting short such an attack is to drink lukewarm water and induce vomiting, and to follow this by a dose of castor oil. Then, with a starvation diet for a day or two and the drinking of plenty of water, the stomach gradually recovers its tone and consents to go back to work again.

Chronic Indigestion or Dyspepsia.

The causes of chronic indigestion are manifold, but usually, and almost always in the beginning, even when the stomach finally becomes actually diseased, the condition is due to improper eating.

It may not be that the sufferer eats too much—although very many people who are not gluttons do that—but he eats improperly. One who suffers from dyspepsia, or who wishes to avoid suffering, should remember that the stomach cannot do all the work of digestion. Before it enters the stomach, the food must be finely divided and mixed with the saliva, which is as certainly a digestive fluid as is the gastric juice.

Too much fluid should not be taken with the meal, but it is not a wise plan to take none, as is sometimes recommended. The gastric juice should not be too much diluted, but if the food is well moistened the juice acts better and more rapidly. One glass of water with a meal is about the right amount. Cool water, moreover, in moderate quantity stimulates the secretion of gastric juice, and a wineglassful of ice-water taken before the meal gives a fillip to the appetite without any of the drawbacks of liquor.

If in spite of all precautions chronic indigestion persists, one should try the experiment of eating only one kind of food at a meal—meat, fish or eggs, without bread and potatoes, or bread and butter without animal food. The stomach which rebels at a mixed meal will often do its work satisfactorily if offered only one article of food at a time.

Intestinal Indigestion.

The stomach was formerly supposed to be the chief agent concerned in digestion, and all dyspepsia was referred to some defect or temporary weakness in that organ, and treated by means of remedies intended to supply the assumed deficiency in the supply of gastric juice.

Important though the office performed by the stomach is, it has now been found not to be absolutely essential, since it has been shown that the food can be digested and made ready for the uses of the body in the intestine alone. Indeed, it is now known that the action of the intestinal secretions is the really essential part of digestion, the office of the stomach being merely to prepare the food and to start the chemical changes which are completed by the bile, pancreatic juice and intestinal secretions. Nevertheless intestinal digestion may be greatly disturbed by the failure of the stomach to do its share, and it is very necessary before attempting to relieve intestinal dyspepsia to apportion nicely the blame and to be sure that the stomach is not primarily at fault.

Intestinal dyspepsia may, then, be secondary to stomach trouble, or it may depend upon disease of the liver, pancreas, or the intestine itself. When any of these organs is diseased, it must be restored to health before the dyspepsia can be relieved; but often the latter is a functional trouble due to faulty nervous action, or perhaps to errors in diet. In such cases, which are not at all

uncommon in young children, the hope of relief rests rather upon a proper regulation of the diet than upon medicine.

Usually it will be discovered that too much starchy food or sugar is being taken. Through failure in the secretion of the so-called "enzyms," which convert these substances into others capable of absorption and appropriation by the tissues of the body, they remain in the intestine and undergo fermentation. Thus they not only are not digested themselves, but the fermentation which takes place interferes with the digestion of the other food matters. By reducing the quantity of these offending articles of diet, or by withholding them entirely for a time, great relief or even cure may be effected.

Biliousness.

This trouble is caused by too much food. The food is taken too frequently, in too great quantity, and is too rich. The symptoms are headache, nausea, sometimes vomiting, and coated tongue. The remedy for an actual attack is to stop all food temporarily, and to take a brisk purgative to remove from the system the accumulated poisons. Take at night a powder made up of five grains of calomel and five grains of bicarbonate of soda, and follow this with a seidlitz powder in the morning. To prevent a recurrence of the attack, eat sparingly, of plain food, at the regular meal hours only. Also exercise vigorously in the open air to keep the various organs active.

Jaundice.

Jaundice is the name of a condition characterized by yellowness of the skin and eyes, the urine being saffron-coloured, and the fæces usually whitish or drab-coloured. It is commonly preceded by symptoms of a disordered state of the liver and digestive organs, as loss of appetite, irregular bowels or constipation, colic pains, nausea, headache, languor, &c. Sooner or later, the yellow colour begins to appear, usually first in the eye, then the face, and then the whole body. Sometimes the yellowness is the first symptom. From the time of the appearance of the yellow hue, many of the preliminary symptoms may diminish. The shades of yellowness are various, from a light yellow to a deep orange hue, and in some cases greenish, or even almost black.

Jaundice arises from the excretion of bile being prevented and retained in the blood, or re-absorbed and diffused throughout the system. It depends upon various and different internal causes. Any kind of pressure upon the excretory ducts will occasion it, as by tumours, &c., or by the ducts being plugged up by mucous, inspissated bile, or biliary calculus. It may also occur as a symptom of acute or chronic inflammation of the liver. A high atmospheric temperature long continued has also a decided influence in producing certain forms of this disease. In general, we may expect a favourable termination of the disease, except when it depends upon structural disease of the liver, or cancerous disease of the surrounding parts. The course and duration of this disease are various, in some cases disappearing or proving fatal as early as the fourth day ; in others continuing for months or years.

The treatment of this disease will in some measure differ according as it arises from some mechanical obstruction preventing the bile from entering the duodenum, or from defective action on the part of the secreting substance of the liver. In the former case, attention must be directed to remove the impediment, and if possible to check the action of the liver till this is effected. In the latter, the action of the liver is to be stimulated. If there be any spasmodic pain in the right side, opium and the warm bath should be used ; a mild diet, and avoidance of stimulants, should be strictly enjoined.

Colic.

Colic is a name applied in a general way to a sudden and severe pain in the abdomen. Physicians recognize many different kinds of colic, each calling for its own separate treatment, which must vary with the underlying cause.

The most usual form is that brought on by the eating of indigestible food and by the presence in the intestines of acid matter. It is often accompanied by intense bilious symptoms, which persist until the system is relieved of the offending substances.

The form of colic which is most to be feared is that called cholera morbus. This is most apt to appear in hot weather, and although painful, is seldom fatal except in the very young and the very old. It may be induced in many ways, by eating unripe fruit or raw vegetables, drinking impure water, living where there are masses of decaying garbage, or where there is overcrowding in hot weather.

The rules for the prevention of this complaint are very simple, as are also the methods of treatment. There must be first and always a strict attention to cleanliness, especially as the weather grows hot. Neglected garbage is as much a poison as prussic acid, and an improperly washed nursery bottle is as deadly as a loaded pistol. When these and kindred truths are recognized by a whole

community, rich and poor alike, the summer death rate will immediately show improvement.

People who are subject to this trouble would do well to wear constantly a flannel bandage over the abdomen, for the least chill while digestion is in process may provoke an attack. During the attack much relief may be had by hot applications, a drink of hot water with a little ginger added, and a very hot foot-bath. Above all, the treatment must tend toward the removal of the offending substances from the system by a dose of castor oil.

Constipation.

It would be difficult to mention one of the so-called minor ills, or slight deviations from health, which is productive of greater harm than constipation. Physicians recognize that one of the most potent factors in the causation, not only of discomfort, but of confirmed invalidism, is what they call auto-intoxication, or self-poisoning of the system by the waste materials of the body which ought to be cast out by way of the intestines.

Various nervous diseases, periodical headache, dyspepsia, skin diseases, ill temper, mental dulness, and even insanity are some of the morbid conditions attributable at times to this absorption of poisonous matter from the stagnant contents of the bowels.

A sluggish state of the bowels may depend upon deficient action of the liver or upon a muscular weakness of the intestinal walls—especially of the lower bowel or rectum, the office of which is the final discharge of the effete material.

The inactivity of the liver may be due to various causes, but it, as well as the torpidity of the intestinal muscles, is most commonly the result of unhygienic living—insufficient exercise, living in overheated and stuffy rooms, irregularity in meals, want of sleep, worry, and, above all, neglect to obey promptly the call of nature.

Another frequent cause of chronic constipation is the injudicious use of laxative medicines, which over-stimulate the intestinal muscles, and, after the immediate effect has passed away, leave them more exhausted and weaker than before.

One who is of a constipated habit should take thought of his diet. The muscles of the bowel, in order to contract, must have something to contract upon ; therefore one should eat fruit, vegetables, whole wheat bread, and such things as will leave a fibrous or woody residue to give bulk to the intestinal contents.

Regular exercise is necessary, as is likewise the breathing of plenty of fresh air. Water-drinking—six or eight glasses or more a day, and especially a glass of cold water before breakfast—should, in one with sound heart and kidneys, be a regular habit. Regulation of the food and drink, sufficient (but not too much) sleep in a well-ventilated room, a regular habit of going to the

closet at the same time each day, mental calm, the repression of worry over one's condition, and strict avoidance of laxative medicines will cure most cases of constipation. If they do not, and the condition threatens to become chronic, then medical advice should be sought.

Diarrhœa.

Diarrhœa is a disease characterized by an increased discharge from the bowels, usually in a very liquid state, and sometimes containing a large quantity of bile. This disease may be occasioned by anything that stimulates or irritates the mucous surface of any portion of the alimentary canal. Besides the various purgative medicines, undressed or indigestible foods or vegetables, acid fruits, oily or putrid substances, frequently cause diarrhœa. Suppressed perspiration, occasioned by a sudden chill or cold applied to the body, or a draught of any cold liquid when overheated, may produce it. It is more apt to occur during the summer and autumn months than at any other period of the year. It sometimes results from the irritation caused by worms, or by some organic disease, and is a common symptom of the advanced state of consumption. Besides looseness of the bowels, this disease is usually accompanied with griping and flatulency, together with an uneasy sensation in the lower part of the abdomen. There are frequently also nausea and vomiting, a bitter taste in the mouth, a furred and yellow tongue, dry and harsh skin, a pale or sallow countenance, and, if not speedily checked, great emaciation.

Diarrhœa is one of those diseases by means of which nature strives to get rid of impurities, and restore the system to its normal condition. Hence, when it is not very violent, and when the patient is strong, it is best to allow it to run its course, at all events for a time, and even to aid it by small doses of laxatives. In any case, great care is to be taken not to stop it too suddenly. Sometimes an emetic is of great benefit in removing the cause of irritation. When it arises from obstructed perspiration, a warm bath, or a dose of Dover's powder, and warm clothing in bed, will usually effect a cure. When it is occasioned by a too acid state of the secretions, the great remedy is chalk mixture. Opium is also frequently employed ; but it should not be used until there is reason to believe that the bowels are free of any irritating matter.

Appendicitis.

Appendicitis is an acute inflammation of the appendix with more or less involvement of the neighbouring peritoneum. Its causes are numerous and varied—cold, constipation, indigestion, pressure, tuberculosis, enteroliths, etc., all of which at one time or another have a predisposing effect, but the efficient cause in setting

up an acute attack is the presence of some form of bacterium in or about the appendix.

An ordinary attack begins with sudden, severe, colicky pain in the abdomen, with perhaps a chill, followed by fever, vomiting and usually constipation. The pain is frequently intense, at first all over the abdomen, afterwards confined more to the right side between the navel and the hip-bone. The fever may be little or much, depending only partially upon the severity of the case. Vomiting may be absent, or may be severe and persistent. When the patient is examined the pulse is usually higher than usual, and its condition is a better guide than the fever. The abdomen may be distended, the muscles are rigid, and there is tenderness on pressure. Often this tenderness is at first general or localized in the pit of the stomach, later it becomes more marked in the region of the appendix. If the case is mild and progressing favourably, there is great improvement in twenty-four or forty-eight hours, but if this improvement fails to take place, or if the symptoms become worse, immediate operation is probably advisable. Operation is not necessary in all cases, and in many cases where it is necessary it can be safely delayed until the patient has recovered from the acute attack, say, in from two to three weeks.

The treatment for an attack is to apply an ice-bag on the tender spot on the right side of the abdomen, give only light fluid diet, and in the vast majority of cases it is not advisable to give any opiate to relieve the pain. The ice-bag usually relieves a great deal. At all times the advice of your own physician should be secured, because there is always danger that a mild case, such as described above, may become more severe, demanding immediate operation if the patient is to have a chance for life. In chronic cases, or where there have been two or three attacks, an operation should certainly be performed to obtain a cure, which cannot be obtained any other way.

Worms.

Worms are parasitical animals which infest the intestinal canal of man. They are chiefly of three kinds—the *Ascarides*, or small thread worms, varying from an eighth of an inch to one and a half inches in length, and having usually their seat in the rectum, or last gut; the *Lumbrici*, or long, round worms, from two or three to ten or more inches in length, and usually occupying the small intestines, and sometimes the stomach; and the *Tœnia*, or tape-worm, of which there are two varieties, occupying the whole tract of the intestines, and sometimes thirty or forty feet in length. Worms appear most frequently in those of a relaxed habit, with weak digestive organs. From the highly organized and sensitive parts which they occupy, worms give rise to great constitutional

derangement, and produce a variety of symptoms, more particularly affecting the stomach and head. Among these are variable appetite; fœtid breath; picking of the nose; hardness and fulness of the belly; sensation of heat and itching in the anus; preternaturally red tongue or alternately clean, and covered with a white slimy mucus; grinding of the teeth during sleep; short, dry cough; frequent slimy stools; emaciation; slow fever, with an evening increase; irregular pulse; and sometimes convulsions or fainting fits.

The treatment varies with the kind of worm. For the thread or pin worms the most efficient remedy is an injection of ordinary table salt. Dissolve two teaspoonfuls in a cupful of water, and with a syringe, to which is connected a long rubber catheter, inject four ounces of the mixture high up into the bowel and let it be retained as long as possible. Repeat every second night for two weeks. The round worms are readily removed by santonin, of which one grain may be given in sugar at night followed by a purgative in the morning. It is against this kind of worms that the worm lozenges so frequently sold are most effective.

Tape worm is much more difficult to remove. It is easy enough to get away perhaps twenty or thirty feet, but unless the minute head is removed it grows again and in about three months treatment must be repeated. First prepare the patient by giving liquid diet for two days. The second evening give a purgative of five grains of calomel with five grains of soda, and follow this by a seidlitz powder at four or five o'clock in the morning. When this has acted freely give the following mixture: Extract of male fern, one drachm; chloroform, half a drachm; castor oil, one ounce and a half. Mix. This is difficult to take but effective. The patient must remain in bed the third day and use a bed pan as the treatment is severe and very weakening. It is necessary to examine the motions carefully to learn if the head has been removed. Afterwards tonics are required to improve the strength.

Hæmorrhoids or Piles.

Hæmorrhoids, or piles, is a disease of the rectum and anus, accompanied by a flow of blood from these parts, when the patient is at stool, recurring after intervals, and sometimes periodically. It is usual to apply the term either to a simple bleeding from the veins of the lower part of the rectum, recurring more or less frequently, yet not accompanied with any distinguishable tumours, either within or on the outside of the anus; or else swellings formed by a varicose distension and morbid thickening of those vessels, either with or without occasional hæmorrhage; or, lastly, tumours originally produced by effused blood, but subsequently converted into an organized substance. They are distinguished

into external and internal piles, according as they are situated outside of or within the anus ; and into *blind*, or such as do not bleed ; and *open*, or such as are subject to occasional hæmorrhage. The tumours vary greatly in size and form, some of them being hardly as large as a pea, others as large as a walnut or apple. They are sometimes attended with great pain, so that the patient can neither sit nor walk, with generally more or less fever and restlessness. Sometimes the patient's strength is greatly reduced by discharges of blood or seropurulent matter ; or inflammation of the neighbouring parts may be induced, causing abscesses, fistulæ, etc. Generally, however, the disease is of a less severe nature.

In its treatment it is of importance that the bowels be kept open by gentle laxative medicines, and great benefit will often be derived from the application of warm water to the part, or from sitting over the steam of warm water when at stool. Compound gall ointment applied to the affected part is usually of great service, Where all other remedies fail, it is often necessary to have recourse to an operation ; but this should only be in very severe cases, as it is not unattended with danger.

Catarrh.

By the rather indefinite term "catarrh" we mean to include certain common inflammations of the nose, throat and ear. The portion of the regions affected is, in each case, the mucous membrane lining them. This protective covering of the interior of these structures is not only of the same kind in each, but it is also, by means of various connecting orifices, continuous.

This close union or connection results in a common associat tion of diseases affecting these various parts. It is a frequen- experience of individuals to suffer with a catarrh of the nose or throat in varying degrees of severity for months or years when, suddenly or gradually, a similar disease of the ears may be added, resulting in impairment of the hearing, tinnitus or ringing in the ears, and less commonly pain in the same region.

It may be said that the majority of cases of impairment of hearing developing after youth are due to the aggravated extension of a long-standing throat or nose trouble, which has gradually involved the ear by reason of the unfavorable effect upon the latter of the diseased condition in the adjacent structures, or by direct extension of the disease to the ear along the Eustachian tube—the tube-like orifice connecting the ear with the throat and nose.

As to preventing the occurrance of this much-to-be-dreaded result, it is plain that this must, for the most part, consist in preventing aggravations of an already existing catarrh in the nose or throat.

Actual obstruction in either of these organs is only amenable to the surgical skill of the physician. On the other hand, much can be done by the individual himself when the catarrhal condition has not arrived at the stage of obstruction, and likewise to prevent recurrence of the attacks when the normal method of nasal breathing has been re-established.

The object to be obtained is an improved hygiene with especial regard to increasing the activity of the skin, liver and other excretory organs. Perhaps some of the hygienic measures particularly beneficial might thus be sketched: Light exercise after rising, followed by the bath, the essential features of the latter being a brisk rubbing of the head, neck and chest. An increased tone in the skin causes it to respond more actively to changes in temperatures and to prevent "colds in the head."

A light breakfast is recommended to the full-blooded or for those inclined to be too fat. An abundance of outdoor life and fresh air is desirable, while for the young and vigorous plenty of exercise is of needed value.

Nosebleed.

Bleeding from the nose may be caused by an injury, such as a violent blow, or sneezing too hard, or snuffing irritating substances up the nostrils, or it may occur as a symptom of constitutional disease. In the latter case it may be the result of any one of several causes. In advanced adult life, for instance, it sometimes means that the person is suffering from Bright's disease or from heart trouble, causing the vessels that feed the brain to become over-distended with blood.

Some people suffer from nosebleed when they climb mountains, or when they go to live at a much greater altitude than that to which they have been accustomed. In these cases, and in all cases caused by over-distension and pressure, the attack of nosebleed is a direct effort on the part of nature to relieve the system, and is therefore a blessing in disguise.

In young people who are making blood very fast—faster than the system requires—there often occur violent attacks which must be, of course, suitably treated, but need cause no great alarm unless they prove very obstinate to simple remedies. This form of nosebleed will disappear as the patient approaches adult life and the whole system finds its balance.

In the ordinary cases of bleeding from the nose in children or young adults, very simple household remedies are generally all that will be needed. It is only when these attacks become two frequent, or when enough blood is lost to make the sufferer white and weak, that more energetic measures will be needed. There is an old wives' theory that the dropping of a large cold door key

down the back will stop nosebleed. This theory has, as usual, its little germ of truth. If a door key is the biggest and coldest thing at hand, it would be well to use it in this way. As the virtue, however, does not lie in the key but in its coldness, cold water compresses applied to the back of the neck and the forehead would do the work quicker and more scientifically. If this has no effect, the sufferer should lie down with the nostrils compressed and the arms raised above the head. Sometimes plugging the nostrils with absorbent cotten soaked in some astringent, such as alum or tannic acid, will be found necessary.

Impure Breath.

The sources of impurities of the breath may be found in three regions, namely, the lungs, the stomach, and the upper air passages, including the mouth, the throat and the nose.

In the greatest number of cases impure breath is the result of conditions in the mouth, throat or nose, conditions which render possible a lodgment and growth of microscopic vegetable parasites.

Prevention and remedy, therefore, depend upon the successful search for these vegetable parasites, and their removal from the harbours where they accumulate.

Decayed teeth offer ideal conditions for the growth of certain germs and fungi. At times no cavities occur, and yet an accumulation of fungoid material renders the breath offensive. In such cases brushing must be supplemented by the use of an antiseptic mouth-wash. Other states of the mouth and throat giving rise to odours, although less well known, are nevertheless common. The depressions known as "crypts," commonly found in enlarged tonsils, furnish harbours for vegetable parasites. Large accumulations may here take place, partly of food, partly of fungoid growth, giving rise to perhaps no other symptom than unpleasant breath.

Deep accumulations of furring on the tongue give rise to similar unpleasant symptoms. Removal of the thick furring by gentle scraping and the use of antiseptic mouth-washes usually prove entirely remedial.

Certain disorders of the nose give rise to some of the most pervasive and unpleasant odours of the breath. Even these, however, are amenable to remedies, although the home use of antiseptic sprays and douches must sometimes be supplemented by treatment at the hands of a physician.

The conditions of the lungs and stomach giving rise to foulness of the breath likewise require more aid than can usually be given by home treatment, although these states are commonly to be prevented by the observance of hygienic rules.

Colds.

A cold may be brought on by exposure, over-fatigue, lack of sufficient clothing, or lack of nourishing food. Whatever tends to lower the vitality will induce cold, as the system when fatigued or enfeebled is not able to resist disease.

One should dress in such a way as to keep even heat and preserve an even circulation over the whole body. Women's dress is often very unhygienic, with heavy skirts fastened by means of bands so tightly about the waist that it is impossible to expand the lungs, while the feet are protected only with cotton stockings and thin soled shoes. When the blood is driven from the extremities by the cold, it goes to other parts of the body which are sensitive or easily inflamed, and congestion and disease follow.

A simple treatment for a cold is a mustard foot bath, mustard plasters applied to chest, back, abdomen, arms and legs, and a stimulant as follows: Glycerine, three ounces; aromatic spirits of ammonia, three drachms; fluid extract of ginger, one ounce. Take one teaspoonful in a glass of hot water an hour before each meal or when chilly.

Fifteen grains of menthol crystals added to one ounce of white vaseline makes an excellent remedy for a cold either to snuff, or to be taken in a microscopic quantity at the end of the tongue, as the vaseline is healing and the menthol warms the throat. A teaspoonful of listerine, half the amount of salt, and quinine the size of half a pea, added to a glass of water makes an excellent gargle for a sore throat. One of the simplest and best remedies to stop a cough is within the reach of every one, and that is deep, full breathing.

A good preventive against cold is to close the mouth and breathe through the nostrils so that the frosty air may be properly warmed by passing through the air chambers of the nose before reaching the lungs. Another good preventive is to take a daily morning sponge bath or dip in cold water, followed by vigorous rubbing with a coarse towel to produce a warm glow upon the surface of the skin.

Laryngitis.

Laryngitis is inflammation of the larynx, and when acute it may be one of the two kinds, simple or diphtheritic. The latter is referred to under the heading diphtheria; the former is considered here. It usually comes on as the result of cold, and frequently it is but a stage in the progress of a cold from the nose to the chest. There is not much fever as a rule, the most troublesome symptom being an almost incessant dry cough with great hoarseness or loss of voice. After persisting for a few days it passes off gradually,

In young children it often occurs in spasmodic attacks at night, simulating membranous croup and causing great anxiety on that account.

The treatment consists of hot or cold applications to the neck, especially over Adam's apple, and the inhalation of vapour which may or may not be medicated. Pour a pint of water into an inhaler or jug, add one-half to one teaspoonful of friar's balsam and inhale the vapour for ten minutes, several times a day. Some medicine such as a dose of phenacetin may be required if the fever is high.

Acute Bronchitis.

Acute inflammation of the mucous membrane of the larger air tubes is a common disease, rarely serious in adults but more dangerous with little ones or the very old. It is a common sequence of catching cold and occurs usually in changeable weather. It is often associated with other diseases, especially measles.

The symptoms are those of a cold on the chest—slight fever, and a sense of oppression, and soreness in the tubes. Cough is frequent and distressing; at first tight, afterwards it gets loose and is accompanied by profuse expectoration. In healthy adults at the end of a week there is much improvement and in another week the patient is quite well.

In mild cases household measures suffice. The hot foot bath or a warm bath, a drink of hot lemonade, and a mustard plaster on the chest will often give relief. For the dry, racking cough Dover's powder, in doses of five grains every four hours, gives most relief.

Chronic Bronchitis.

Chronic bronchitis may follow repeated attacks of acute bronchitis, but it is usually met with as the winter cough of old people, which recurs as soon as the weather gets cold and changeable, and tends to get worse with each recurrence, until after a time it remains permanently. The cough is usually most trying on first getting up in the morning, and only ends after the phlegm which has gathered during the night has been got rid of. As time goes on, the breathing becomes shorter, till a very moderate walk, or

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climbing a short stair, or even talking much, produces considerable distress. The expectoration varies in character and quantity —at times it is thin, white and frothy, and very abundant and easy, while at others it is scanty, thicker and yellow. By and by, when the heart begins to fail, there may be streaks of blood in it. As a rule, there is not much actual pain or feverishness; but after a severe chill there may be a great deal of both. The tendency of this disease is ever downward, and there often is much emaciation before the end. The chronic obstruction of the tubes by the permanently thickened swollen mucous membrane, as well as the tendency of the denser particles of mucous to sink down into the smallest tubes and even the air cells themselves, causes such an amount of strained respiration that many of the air cells burst, producing in time a condition known as empyæma. This is characterized by great shortness of breath, and can be detected also by the blown-up, round, "barrel-shaped" form of the chest. Then the circulation of blood in the lungs is interfered with; the heart becomes weakened with its increased efforts, and enlarged and dilated, until dropsy appears in the limbs as well as in the lungs themselves, which increases the wheezing, the cough and breathlessness. The face and other parts become purplish red, and the internal organs very congested. Weakness increases, until the heart gives up altogether; consciousness is very often abolished some time before, the brain being poisoned by carbonic acid through want of oxygen in the lungs.

The safest treatment of this disease is, of course, always to winter in drier, warmer quarters than can be got in this climate. But, failing that, much can be done by careful attention to clothing, having the mouth covered when out in the cold, and avoiding fatigue or over-exertion. Cod liver oil and malt ought to be largely taken, especially when the body is seen to be wasting. When the heart is failing and dropsy commencing, five drops of tincture of digitalis or three drops of strophanthus should be added. When the expectoration is more difficult and the cough very troublesome, confinement to a moderately warm room will be necessary. Medicated inhalations should be used frequently by means of steam kettle or jug, or simple ordinary inhaler, creosote or terebene being employed. Twelve or fifteen drops of terebene on a small lump of sugar may be also tried when the cough is harrassing.

Asthma.

Asthma is often a family affection, and is frequently traceable to parents, grandparents or great-grandparents. Most sufferers are of an excitable, emotional or "nervous" temperament. It bears a rather striking analogy to epilepsy in that its attacks are char-

acterized by suddenness and influenced by strong emotions like fear or grief, and not infrequently occur at night, when the sufferer may be plunged from deep sleep into an attack. In both diseases excitement during the day is often followed by attacks.

Physicians believe, however, that a high-strung organization alone is not sufficient to develop the disorder, but that some other source of irritation must be added—that is, some faulty state of the system elsewhere, like disease of the digestive track, harmful factors circulating in the blood, obstacles to free breathing in the nose, and others.

Whatever may be the source, it must be dealt with energetically and at an early stage, since long-standing cases of asthma invariably develop changes in the lungs and heart which are permanent. The disease can then be dealt with only by measures aimed at palliating and cutting short the separate attacks, and with no reasonable hope of an actual, permanent cure.

For the young sufferer and for those in the early attacks of asthma, the writer would emphasize the necessity of a thorough search for, and the removal of, any and every error in hygienic living in order to avoid the suffering of the chronic asthmatic and the further diseases which it brings in its train.

Pneumonia.

Pneumonia is a disease characterized by inflammation of the lungs and caused by a special germ, the Diplococcus pneumonæ. It is, therefore, really an infectious disease though not commonly classed as such. It is very widespread, occurring in all climates and at all ages, and cold is a permanent predisposing factor.

Its onset is marked by a severe chill, lasting perhaps half an hour. The fever rises quickly, there is severe pain in the side with every breath, and a short dry cough. The fever in pneumonia is high, from 104 to 105 degrees, and remains high for from seven to nine days ; then if favourable, it drops suddenly, forming what is called the crisis, and with the crisis the patient may have a profuse perspiration, followed by a long sleep from which he awakes refreshed and with a clear mind. Pain, difficult breathing and frequent cough are very marked symptoms throughout the course of the disease. It is a very fatal disease, carrying off from twenty to forty per cent. of all cases. It is particularly dangerous in old people and in those addicted to alcoholic liquors, very few recovering from even moderate attacks.

The treatment requires the patient to be kept in bed as absolutely quiet as possible, with abundance of fresh air for the laboured breathing, and nourishing liquid food in small quantities at frequent intervals. Poultices for the chest changed carefully every two hours help to relieve the pain. Medicines are requir sup-

port the heart, and for this purpose trychnine is most valuables. It should be given freely under the direction of the attending physician. Pneumonia is such a severe illness that if possible a physician should always be called in, but if one cannot be obtained much can be done by care as indicated above and by faithful nursing, day and night.

Broncho-Pneumonia.

Broncho-pneumonia, sometimes called capillary bronchitis and catarrhal pneumonia, is almost always an extension of bronchitis into the smallest bronchial tubes, ultimately affecting the air cells, and is exceedingly dangerous to children and feeble old people. It is very often to be found following measles, whooping cough and influenza. Its importance is chiefly with reference to young children, among whom it is very common and very fatal. Every attack of bronchial catarrh, however slight it may be in the beginning, especially if a child is teething, must be watched with the greatest care, and treated as a serious condition, for almost from the beginning, without any defined sign or warning, it rapidly runs into an urgent case of illness. The breathing is soon seen to be quick, short and shallow, with the nostrils working vigorously. The pulse becomes more rapid and weaker. On putting the ear to the chest numerous humming or fine bubbling sounds are heard. There is gradual increase in the nnmber and violence of the fits of coughing: there is restlessness, alternating with listlessness and weariness, and the face begins to show an anxious, distressed look. A child rarely brings up the expectoration further than the back of the throat, but most of it is swallowed into the stomach, and this is likely to produce some diarrhœa. The child is eager enough for drink, but not at all for food; and latterly, for want of breath, it is unable to swallow anything. It dies from suffocation and exhaustion, for the finest tubes and air cells often get clogged up, becoming impervious to air, and the struggling for breath, lack of nourishment and feverishness complete the disaster.

The child should be kept almost entirely in its cot in a room kept at 65 degrees of heat, but at the same time well aired, and a steam kettle should be kept constantly pouring steam into an improvised tent around the bed. The chest should be rubbed twice or thrice a day with turpentine or ammonia liniment, and be encased in cotton wool. An expectorant mixture should be given such as the following: Potassium acetate, three drachms; aromatic spirits of ammonia, two drachms; wine of ipecac, one drachm; syrup of orange, one ounce; water to four ounces. Mix. Give one teaspoonful in a little water every two, three or four hours, according to the severity of the case. Small doses of weak

brandy and water will probably be essential, perhaps every four hours. Warm milk and barley water, or weak mutton broth should be given in frequent small supplies. But one of the most effective means of cure is the application for half a minute three or four times a day of a couple of sponges filled with cold water to the chest and back at the same time. This causes the child to gasp, and deep inspiration takes place, which expands the chest and allows air to enter the air cells. At the same time it has a tonic effect on the nerves of the lungs and the muscles of respiration, and distinctly lowers the fever temperature.

Pleurisy.

Pleurisy is inflammation of the pleura or fine serous membrane covering the lungs and lining the chest wall. The inflammation converts the smooth, moist membrane into a dry, rough one, with the result that severe sharp stitches of pain are felt with the movements of breathing and coughing. The breathing is, therefore, somewhat embarrassed, shorter, and shallow. The temperature, as a rule, is only slightly raised, and the pulse is quickened and hard usually. All the signs of fever are present, but rarely very pronounced. There is a very little thin, frothy expectoration. If the case progresses favourably it is called "dry pleurisy." But as often as not fluid is gradually exuded, and then we have what is known as "pleurisy with effusion." As the fluid increases it presses in on the soft, yielding lung, compresses it considerably, and so seriously impedes the respiration perhaps of the whole lung. Breathlessness becomes more marked, and on any sudden movement it is not very uncommon for the breathing and the heart to stop. The patient can lie only on the back or on the diseased side, so as to allow the healthy lung free play.

In the first instance, the patient must take to bed as soon as the condition is discovered, because rest to the lungs and ribs is imperative, and that is incompatible with moving about. A mustard leaf or poultice should be applied to the part for half an hour, and cotton wool wrapped round the chest. At the same time eight grains of Dover's powder may be administered every four or six hours till some relief is obtained. Strapping the side of the chest which is affected with inch-broad strips of sticking plaster, one above and slightly overlapping another, and reaching from the spine behind to the breast-bone in front, gives the chest wall rest. When effusion has taken place, the diet should be restricted as much as possible to milk and solid food. If the effusion does not diminish, it will have to be drawn off. Often it becomes composed of pus, which is known by the rise in temperature, tendency to flushing and sweating, and increasing weakness. This is called empyæma and requires special surgical treatment.

One great danger of pleurisy with effusion is that it is apt to be followed by consumption, hence during convalescence the patient should be in the sunshine and fresh air as much as possible. He should also take regular breathing exercises morning and evening to expand the compressed lung tissue and to avoid places for the lodgment of the tubercular bacilli.

Acute Bright's Disease.

Acute Bright's disease, or acute inflammation of the kidneys, may be caused by cold or exposure, or may follow other diseases, especially scarlet fever. It comes on rapidly, with almost or quite complete cessation of passing urine. Then in a day or two the face and extremities become swollen and very pale. The urine is scant, high-coloured and contains blood. When a little is boiled in a test-tube it may become quite solid. Uræmic symptoms may develop, but usually with treatment the severe symptoms gradually subside, and after a long time the patient recovers. Sometimes, however, chronic Bright's disease follows. The treatment requires rest in bed, milk diet, liberal use of mineral waters, water, lemonade, and keeping the skin and bowels active, so as to relieve the kidneys as much as possible. Sweating is produced best by vapour baths, or hot packs. The bowels should be kept open by liberal use of saline purges such as fluid magnesia for children, and Epsom salts for adults. As soon as the more acute symptoms have passed off, tincture of iron should be given to improve the blood. Five to ten drops may be given in water three to four times a day.

Chronic Bright's Disease.

Chronic Bright's disease, or chronic inflammation of the kidneys, is a particular disease of the kidneys, named after the late Dr. Bright, who first pointed out its nature and character. It is characterized by gradually increasing debility, with shortness of breath, headache, drowsiness, pallor, and usually puffiness of the face, a frequent disposition to make water, dyspepsia, flatulent distension, with attacks of nausea and vomiting. There is also a remarkable tendency in this disease to an inflammatory or congestive state of other important organs; and hence bronchitis, phthisis, coma, convulsions or apoplexy, not infrequently occur during its progress. The heart, too, may become implicated, and dropsy almost always occurs sooner or later.

The disease essentially consists in a degeneration of the tissues of the kidneys by which their secreting powers are impaired, and the urea which should be separated from the blood is retained, while the albumen, which is the great agent of nutrition in the system, passes off in the urine. Hence, the existence of albumen in the urine is the distinguishing characteristic of this disease.

Besides this impoverishment of the blood from the impaired action of the kidneys, it retains more or less of its urinous excrement, and at length the body is poisoned by the retention of its own excrement. This disease may be occasioned by severe cold, repressed perspiration, or immoderate use of ardent spirits; and it not uncommonly follows scarlet fever. It may likewise be hereditary.

In the treatment of this disease the diet should be well regulated, and intoxicating drinks, sugar, starch and fatty substances, abstained from. The secretive action of the skin should be promoted by means of a warm bath, warm clothing, warm atmosphere, and diaphoretics, as Dover's powder. Flannel should be worn next the skin, and exercise, change of air, and sea voyages are recommended. Cupping over the loins and warm fomentations are useful in counteracting the more acute forms of this disease. It is necessary also to stimulate the action of the kidneys by diuretics, the most valuable of which is the bitartrate of potash, or cream of tartar. The bowels should be kept in a relaxed state by the frequent administration of purgatives.

Calculus; Stone in the Bladder.

The term calculus is applied to any little stone that forms inside the body, the most usual places being in the gall bladder, kidney or bladder. The stones vary in size and number, and when they attempt to leave the gall bladder or kidney cause excruciating pain, which often requires morphine for its relief. Once it arrives in the bladder, the stone enlarges and after a time causes pain. This pain is severe, and worse just after the bladder has been emptied, when a few drops of blood may be noticed. Once formed, nothing will remove the stone except operation. This may consist either in crushing the stone inside the bladder and washing out the fragments, or in opening up into the bladder and removing the stone through the opening.

Sciatica.

Sciatica is a disease in which pain is referred to a certain nerve, named the sciatic. This is the largest nerve in the body, a great cord, pearly white to look at, nearly as thick as your little finger, and built up of " wires " which carry to and fro between the brain and practically every part of the leg, the countless messages upon which depend the power, feeling, and nourishment of the limb. Deep-seated at the top of the leg, at the back and towards its inner aspect, this nerve courses down the limb, dividing into branches as it goes—and the sufferer from sciatica can often map out its course by the distribution of his pain. The ache is always there, more or less ; but with movement, especially movement which puts the nerve upon the stretch, comes absolute agony.

Sciatica may be a neuralgia or it may be a neuritis. That is to say, there may be no change apparent in the nerve to account for the suffering, or there may be an unmistakable inflammation. More than that, this inflammation may arise from rheumatism, or gout, or cold, or damp or from injury of various kinds, as over-stretching, too much walking, pressure through sitting awkwardly on a hard seat. Similiarly, bone disease in the neighbourhood of the sciatic nerve and various other ailments and tumours may be responsible for this trouble. Thus for a doctor to pronounce at once the exact condition present in any case of sciatica is not always easy or possible.

Treatment—apart from the use of drugs and means safe and effectual only in skilled hands—resolves itself chiefly into rest for the sufferer and a judicious punishment of his skin. He must lie in bed and confine himself to plain milk and milk-pudding diet. A daily action of the bowels must be secured. Then as to punishment, small mustard poultices, say, two or three, may be laid on the skin over aching spots ; left on until redness or even blistering occurs ; and repeated in a couple of days. Or fly blisters, each two inches long by one inch wide, may be applied instead, in which case their rising is made easier and speedier if each, once it is on, is covered by a linseed poultice. Blisters have to be let out, and a piece of linen, smeared with vaseline, laid over the spot.

Apoplexy.

Apoplexy is a disease characterized by a sudden loss of consciousness and voluntary motion, while the organic functions of the body—circulation, respiration, secretion, &c.—are still carried on, but usually in a more or less impaired state. The face is generally flushed, the breathing slow, deep and stertorous, the pulse fuller, stronger and slower than natural, and the skin covered with a cold, clammy perspiration ; sometimes, however, the pulse, instead of being full and strong, is weak and intermitting, and the face pale and dejected. It is a state of coma, occurring suddenly from internal pressure upon the brain. It is frequently difficult to distinguish it from coma arising from other causes, as from alcohol, opium, chloroform, &c.; and yet it is of the greatest importance to be able to distinguish them, as they require to be treated differently. The history of the case, the general appearance and age of the individual, the presence or absence of the odour of spirits, may be the only points to which we can look for the solution of the difficulty.

Apoplexy is occasioned by whatever unduly impedes or accelerates the circulation of the blood within the brain, or exerts a certain degree of pressure upon it. Hence, violent exertion, either of mind or body, great mental anxiety, intemperance in eating or

nking, are among the exciting causes of it. Though the attack is usually so sudden, it is not without its premonitory symptoms, which, though numerous and diversified, are yet obvious and easily understood. Among these are excessive drowsiness, giddiness and headache, with, frequently, dullness of hearing, imperfect or disordered vision, noise in the ears, loss of memory, &c. Sometimes the attack is preceded by paralysis affecting the speech, hands, feet or other parts of the body, and frequently it is succeeded by paralysis.

Apoplexy may terminate in three different ways—(1), it may cease, more or less rapidly, and leave the patient, to all appearance, in perfect health; (2), the patient recovers, but with his mental powers enfeebled, sensation impaired, or voluntary motion limited; (3), it may terminate, more or less quickly, in death, in which case there may be found to be a quantity of extravasated blood on the brain, an effusion of serum, or there may be no appearance whatever of the disease. When judicious remedies are adopted in time, an attack may generally be averted or rendered comparatively mild. Much necessarily depends upon the patient himself; upon his avoiding those states and modes of life that predispose to it, taking regular and moderate exercise, and attending to the state of his bowels. The active treatment to be adopted during or preceding the attack differs according to the cause that may have induced it. In some cases the abstraction of blood may be indispensable; in others stimulating remedies are what may be required. In all cases, however, the patient's head should be raised, the head and neck bared, and the freest circulation of fresh air promoted; and, as soon as possible, purgative medicines should be administered. The attack may last from a few hours to two or three days; and even when it does not destroy life, it usually gives a shock to the constitution, which is seldom entirely recovered from.

Epilepsy, Falling Sickness or Fits.

Epilepsy occurs usually in families which are of very nervous disposition, and may be brought on by injuries to the head, tumours, frights or violent mental emotions. Its attacks vary in severity and frequency. Sometimes they occur only at night, and the patient knows of them only by the langour next day.

The attack is usually sudden and unexpected, begins with a cry and the sufferer falls. The face becomes distorted, and all the muscles of the body become momentarily rigid, and the face purple; then the muscles begin alternately to contract and relax, so that there is spasmodic jerking and movement of the eyes, head, jaws, body and extremities, the tongue being often bitten by the spasms. After a longer or shorter period the movements gradually lessen, the patient becomes quiet, and passes into a long sleep,

from which he wakens later, dazed and sore all over. In some cases the attacks become more frequent and severe, and finally result in epileptic insanity. In others they remain of about the same character always, while in still other cases they respond to treatment and improve.

Treatment is unfortunately only too unsatisfactory. During the attack the principal thing is to see that the patient does not injure himself, and a piece of cork or other gag ought to be placed between his teeth to prevent injury to the tongue ; the dress should be loosened about the neck and chest ; the head, if possible, a little raised, and a free circulation of air maintained. Where the disease can be traced to any special exciting cause—as injuries of the head, worms, teething, &c.—the treatment should be first directed to its removal. Where, as is often the case, a plethoric state appears to occasion the disease, the patient is to be restricted to a low diet, frequent purgatives are to be given, and everything avoided that may direct the blood to the head. If, on the contrary, there are marks of inanition and debility, a generous diet, with tonic medicines and other means of strengthening the system, will be proper. In the interval between the attacks, the bromide salts may be given, such as ten to twenty grains of bromide of potassium in a glassful of water, three times a day after meals.

Fainting.

The habit of fainting is not so much a sign of weak heart as it is of an excitable circulation. It is caused by anæmia of the brain, resulting from a dilatation of the blood vessels of the body, and the consequent flow into them of the entire mass of blood. The absence of blood from the brain arrests the action of the heart and produces loss of consciousness. It is probable that the heart does not stop beating entirely, but acts so feebly that no pulse can be felt. Alarming as a fainting spell may be, it is very seldom indeed, when the heart is not actually diseased, that a person dies in one.

In the case of a fainting fit, the first thing to do is to lay the person flat on the back, if possible with the head lower than the feet, and then to loosen all the clothing. Vigorous fanning and sprinkling the face with cold water will help to equalize the circulation. Burning a feather under the nose is sometimes of service. Smelling salts may also be used, but ammonia water is inadvisable, as the person may suddenly take a deep breath and inhale a powerful dose of the pungent gas. Brandy and all other alcoholic stimulants will do more harm than good.

Persons who are subject to fainting spells should avoid hot rooms and hot baths, stimulants of all kinds—strong tea and coffee as well as alcohol—and food of an indigestible nature.

Headache.

Headaches are due to a variety of causes. One kind of headache is the result of nerve strain. Work, properly so called, will never produce a headache, in fact it is one of the best preventives, but anxiety and incessant worrying over trifles will certainly cause the headache of over-strain. The headache of anæmia, common enough among young girls of low vitality, is due to a nervous system ill-nourished, with impoverished blood. Many obscure neuralgias have thus a very simple explanation.

A second great cause of headache is eye strain. This form of headache follows close eye work, such as reading, writing or sewing. It is worse at night. and is practically absent in the morning, differing from other forms of headache. It may be taken for granted that headache present in the morning is not due entirely, if at all, to eye strain. All sufferers from headache should have their eyes examined by an oculist.

A very large number of headaches come under a third category —namely, headaches due to poisons in the blood. The "throbbing headache" is often caused by what medical men call over blood pressure or too high blood pressure, due to impurities or toxins circulating in the blood. They generally arise from disorders of digestion in the stomach and bowels from improper diet, the over-eating of meat and rich dishes, imperfect mastication, foul teeth, and lack of exercise. Relief will not be permanent so long as new toxins are being produced—that is, so long as we persist in over-eating rich dishes and neglecting the rules of health.

A fourth kind of headache is migraine or sick headache, which returns at regular intervals. It begins with symptoms referred to the eyes, lasts with great intensity for perhaps a day, and then terminates with an attack of vomiting. This kind is best treated by regular washing out of the stomach through a stomach tube.

Neuralgia.

Neuralgia is a painful sensation in a nerve, arising from some disease affecting the function or structure of the nerve or its centres. It is thus of two kinds, — functional, when unconnected with organic lesion at any part of the nerve's course or at the nervous centres, or, structural, when connected with some organic change,

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acute or chronic, more frequently the latter, at some part of the nerve's course, or at the nervous centres.

The causes of neuralgia are various, and generally obscure. They may be either constitutional or local ; the former arising from some enfeebled state of the body or an impoverished condition of the blood, the latter from inflammation of the enveloping sheath of the nerves, or the development of tumours near or along their course. It may also be caused by the circulation of poisonous secretions, as urea, bile, &c., in the blood, or by the miasm of marshy regions. The pain is intense but intermittent ; sudden in its onset, and abrupt in its departure ; shooting or plunging in its character, and often quite excruciating ; readily excited by the slightest external impression, but seldom aggravated by firm pressure on the part,—on the contrary, often relieved thereby.

The treatment necessarily depends much upon the cause whence it proceeds. When it arises from an enfeebled or impoverished state of body, tonics, nourishing diet, and out-door exercise are to be employed ; and in the other cases the treatment will require to be directed to removing the causes from which it springs. Where it depends on the pressure of tumours that can be removed, the pain will generally disappear with the removal of the cause. In inflammation of the nerve-sheath, local counter-irritation by blisters &c., usually gives relief, and generally effects a cure. Temporary relief in all forms of neuralgia may be obtained by the administration of remedies such as phenacetine, anti-kamnia, &c. Local application of heat is also very useful in relieving the pain. A rubber hot water bottle is very convenient for this purpose.

Sunstroke.

Sunstroke is caused by excessive heat, and especially if the weather is muggy. It is more apt to occur on the second, third of fourth of a series of hot days than on the first. Loss of sleep, worry, excitement, close sleeping rooms, debility, and abuse of stimulants predispose to it. It is more apt to attack those working in the sun, and especially between the hours of eleven o'clock in the morning and four o'clock in the afternoon. On hot days wear thin clothing. Have as cool sleeping rooms as possible. Avoid loss of sleep and all unnecessary fatigue.

If working indoors and where there is artificial heat (laundries, etc.), see that the room is well ventilated. If working in the sun, wear a straw light hat (not black, as it absorbs the heat), etc., and put inside of it, on the head, a wet cloth or a large green leaf ; frequently lift the hat from the head and see that the cloth is wet. Do not check perspiration, but drink what water you need to keep it up, as perspiration prevents the body from being over heated. Have, whenever possible, an additional shade, as a thin umbrella

when walking, a canvas or board cover when working in the sun. If a feeling of fatigue, dizziness, headache, or exhaustion occurs, cease work immediately. Lie down in a shady and cool place, apply cold cloths to and pour cold water over head and neck.

If any one is overcome by the heat, send immediately for the nearest good physician. While waiting for the physician, give the person cool drinks of water or cold black tea, or cold coffee, if able to swallow. If the skin is hot and dry, sponge with or pour cold water over the body and limbs, and apply to the head pounded ice wrapped in a towel or other cloth. If there is no ice at hand, keep a cold cloth on the head and pour cold water on it, as well as on the body. If the person is pale, very faint, and pulse feeble, let him inhale ammonia for a few seconds, or give him a teaspoonful of aromatic spirits of ammonia in two tablespoonfuls of water with a little sugar.

Slight Wounds and their Treatment.

Slight wounds are not of uncommon occurrence, and much can be done by the amateur doctor. Wounds are either incised, punctured, contused, or lacerated.

Incised wounds are clean cut. But as they may also be dirty as well, the first thing to do is to wash them and remove dirt and grit. If there is very smart bleeding it may be better not to wash it, but to stop it by means of pressure, but the cold washing is often enough of itself to check the flow of blood, assisted by elevation of the limb or part. That being done, the edges of the wound should be as neatly as possible brought together, and narrow strips of sticking plaster fixed across it at some distance from each other. This must be particularly attended to in cuts about the face. A bit of dry boracic lint should then be placed over it, and a light bandage applied. If the wound is too large for adjustment with plaster, stitches must be introduced by the surgeon when he can be got. The wounded part should then be placed in as easy and comfortable a position as can be had.

Punctured wounds are deep, narrow ones, the result of pressing and stabbing instruments. There is little to be done with these but to wash them and clean them out by a gentle syringing, preferably with a mild carbolic lotion, if at hand. They should not be closed, but some boracic lint may be applied as a dressing.

Lacerated wounds are ragged and irregular, produced by tearing. They should be treated like incised wounds, only the edges will not be as neatly united. If severe, not much can be done, but give attention to cleanliness and comfortable position. They are of a more dangerous character, and more difficult to heal, being more prone to be followed by suppuration. They should, therefore, from the beginning be treated by antiseptic washes.

Contused wounds, the result of severe bruising, are equally serious. The effects of the violence on the parts is to make them apt to die and slough off. If severe, warm water should be used ; if slight, cold.

How to Stop Bleeding.

It often happens in cases of accident that the danger to life is greatly increased by, if not solely dependent upon, the loss of blood, the injury itself being a comparatively trivial affair. Whether light or serious, the wound can wait, indeed in most cases must wait, for the arrival of the physician, but the bleeding waits for nothing—it must be arrested speedily, and if it is not stopped by some one on the spot, or if it does not cease spontaneously, the coming of the physician may be useless, for the wounds of a dead man need no binding.

The fact should not be lost sight of that the most copious bleeding can always be arrested temporarily, and often permanently, by simple pressure made directly on the bleeding point. If you can put your finger (literally) on the source of the hemorrhage and keep it there, your wounded companion will not bleed to death, at least not while under your care.

One must make sure, in doing this that the finger is really making pressure on the bleeding point, which may be deep down at the bottom of the wound ; but the continuance of the bleeding will soon prove that the finger, or the cloth pad, or the rounded stick, or whatever is used to make pressure with, is not pressing on the right spot. Care must be taken not to soil the wound with dirty fingers or a dirty rag. If time and opportunity permit, the finger should first be washed or at least wiped with a clean cloth, and if a cloth pad is used the outer layers at least must be free from visible dirt.

In almost any company some one may be found who has a clean handkerchief in the pocket. One which has not been unfolded is best, for this can then be folded inside out and made up into a clean pad of any desired shape.

Burns and Scalds.

The injuries inflicted by burning and scalding are similar—in the one case the harm is done by dry heat, in the other by steam or liquid. In each case treatment is based on the same principle, that is, to keep the air away from the injured part. That is the first point, and when it has once been looked after, steps may be taken to remedy the harm.

In the case of a scald produced, say, by a person upsetting a pot or kettle of boiling water over his foot, the first thing to do is to get the boot and stocking off quickly. This must be done with great care to avoid tearing the skin off the injured part. The best

plan is to cut off the boot, cutting the lace and also the boot if necessary. Then cut along any dry part of the stocking, and if any part clings firmly, leave it on ; on no account must it be dragged off. Then immediately place the limb in warm water. This will probably be handy and will soothe the pain by excluding the air. When this has been done, there will be time to get other more permanent remedies ready. The best is that known as carron oil. It is prepared by mixing any vegetable oil, such as linseed or olive oil, with an equal quantity of lime water. This mixture is thick and honey-like in consistency. Little strips of rag or lint should be dipped in it, and then laid lightly on the scalded limb. Over this dressing should be laid thick layers of cotton wool or flannel, all being kept in place with a large handkerchief or bandage. If there is no lime water handy, the oil may be used alone, any kind of vegetable oil, such as linseed, almond, or ordinary salad oil, but on no account should a mineral oil be used, such as coal-oil, or paraffin. If no oil can be obtained, flour, whiting, or chalk may be used. This should be dusted on thickly over the scalded limb, or else it may be made into a thick paste and smeared on thickly with a soft brush or a piece of silk.

One who has been burned or scalded is often terribly frightened, and suffers from what is known as "shock", that is, his temperature runs down rapidly, and immediate steps must be taken to check it. If it is allowed to get down far below normal, all attempts to raise it may be unavailing and death result. The patient should be immediately enveloped in a warm blanket or large shawl, put to sit fairly near the fire, and given as soon as possible a hot drink. Milk, tea, coffee or cocoa may be given, and if the patient seems to be sinking, a teaspoonful of brandy should be mixed with the milk ; or strong hot beef tea may be given. The chief point is to avoid all delay ; give promptly that which is second best rather than wait for that which is really best.

Dislocation and Sprain.

When a bone is broken the various signs or symptoms can usually be easily recognized by any one. You have first of all pain at the seat of injury, movement where there is no joint, and intense pain on attempting to move the limb below the seat of fracture.

In the case of dislocation, one or more bones are removed from their natural sockets, and naturally, there is no movement where there ought to be a joint. The most common dislocations are those of the shoulder and hip. It is rare to have the elbow, wrist, knee, or ankle dislocated. These are what are called hinge joints, but, although they are not liable to dislocation, they are very liable to sprains. Perhaps the most common dislocations are those of the what it is to "go over the ankle." That popular phrase signifies

that the ligaments which hold the bones in position are stretched, and the result is severe pain and swelling, so, then, we see that a sprain is merely a modified form of dislocation, that is, without displacement of the bones.

As regards treatment, the most soothing is warm applications to the dislocated joints. A non-professional individual ought never to attempt to put a dislocated bone into its proper place. In sprains, again, the hot applications are beneficial, and, in order to allay the swelling which always results, friction is found to do good. Unfortunately, in cases of sprain of the ankle there is generally a fracture of the outer ankle bone, and, such being the case, it is well to seek medical assistance in all cases of sprain. The favourite liniment is arnica, but patients should be careful in applying this unless diluted with water in the proportion of 1 in 7. After warm applications for one or two days, a firm bandage applied over a layer of absorbent cotton gives best results.

Contusion of the Knee.

The knee is the largest and the most complicated structure of all the joints, and by its exposed position it is more liable than any other to injury. Owing chiefly to its peculiar construction, inflammation of the entire joint is often excited by an apparently trivial blow or bruise, and this is sometimes followed by more or less protracted impairment of function.

After inflammation has been excited, the sac-like "synovial" membrane soon becomes distended with fluid, and the joint is consequently extremely sensitive to touch and exquisitely painful on motion. In a person affected with tuberculosis or of a strong tuberculous tendency, and occasionally in one not having a recognized predisposition, the inflammation may become suppurative. The joint must then be opened, and the result in many cases is permanent rigidity of the limb.

The most important element in the treatment of knee joint injuries is rest—complete rest, so far as the knee is concerned, But whether this is to be secured by confining the injured person to his bed or by encasing the limb in a plaster of Paris dressing, must be determined by the surgeon. Omission of the splint is sometimes desirable in order to leave the joint more accessible for applying hot, cold or moist dressings.

The immediate application of cold in the form of an ice-bag or a folded towel wrung out of ice-water and frequently renewed, sometimes prevents the occurrence of inflammation ; hot applications are generally reserved for the treatment of the inflammatory stage. In appylying cold, the ice-bag must not be allowed to remain too long without removal and salt must never be mingled with the ice, for in that way the skin can be quickly frozen.

The greatest caution is to be exercised in freeing the limb from restraint after the swelling and tenderness have subsided. Moderate exercise is beneficial, when the proper time arrives, but a slight excess is highly injurious ; care must be taken not to put the weight of the body on the joint so long as there is a possibility of inducing a recurrence of the inflammation.

Chilblains and Frost-bite.

The proper treatment of both chilblains and frost-bite is to restore the normal circulation as soon as possible, but not by applying heat too rapidly. Friction is usually the best and least painful method, for in severe frost-bite there is danger of producing inflammation or even gangrene if the parts are warmed too suddenly. The time-honored custom of gradually thawing out the affected part by rubbing with snow is a safe one to follow, and it is well to remember that this ought not to be done in a warm room or near a fire, but in a cool place.

Although the main point in treating chilblains is to keep up a high standard of general health, direct applications will often be found serviceable, because they check the irritation at its seat. One excellent lotion is a solution of a teaspoonful of sugar of lead in a pint of water. In the case of broken chilblains, it is best to dress them with lanolin, or with oxide of zinc ointment applied on lint.

People who suffer from chronic chilblains should bear in mind that the combination of dampness with cold is much worse for them than cold alone, and should always wear thick woollen stockings and gloves in winter, and avoid tight shoes, circular garters, or anything else which impedes the circulation of the blood.

Corns.

A corn is a thickened state of the epidermis, or outer skin, caused by friction acting upon the true skin, which causes an increased growth of the flattened cells of which the epidermis is composed. The corn, produced in the first place by external pressure or friction, soon becomes in itself an additional source of irritation, and by its hardness increases proportionately the inflamed and sensitive condition of the true skin underneath. If the causes are removed the disease gets well. Tight shoes are undoubtedly the most general originators of corns, but badly made, ill-fitting shoes also give rise to the affection, not by pressure, but by friction. Soft corns generally form between the toes and are very troublesome and painful ; they are kept soft by continual perspiration of the part.

The most efficient cure for corns is, of course, to get rid of the cause—the offending boot or shoe ; but as some persons are so

liable to the affection, or have the feet so formed that if they wear boots or shoes at all they must suffer from corns, the best palliative is keeping the hardened mass well pared down in the centre. Strong acetic acid applied to the corn every evening will sometimes effect a cure, or a little olive oil smeared over every morning. Another good treatment is to paint daily with a solution of thirty grains of salicylic acid in one ounce of collodion. This evaporates quickly, hence must be kept well corked.

Various corn-plasters are used. The most effective and rational are those which are made thick and have a hole cut on the centre of the corn, which is thus preserved from pressure. Soft corns should be cut with scissors, and the roots touched with strong acetic acid, and cottonwool placed over them afterwards to protect the adjoining toe from the effects of the acid, and the strictest cleanliness observed.

Bunions.

A bunion is a painful inflammatory swelling of the foot, most commonly about the root of the great toe. The pressure of tight shoes is usually the exciting cause. This pressure usually acts in such a way as to turn the point of the toe outward, thus causing an actual dislocation of the joint at the root of the great toe. The remedy then consists in wearing shoes which will avoid all such pressure. Often it is necessary to support the toe by a splint to keep it in direct line with the foot. Sometimes the dislocation and inflammation are so bad that an operation is required, in which the adjacent ends of the bones are removed, thus allowing the big toe to go back into its proper place.

When inflamed, lead lotion, poultices or other hot applications may be used, with temporary rest and elevation of the foot.

Ingrowing Toe Nails

A very common and troublesome affliction is that which is popularly termed "the ingrowth of the nails," and which most usually occurs by the side of the great toe. The surrounding soft parts first become swollen and inflamed by constant pressure against the edge of the nail from the use of tight shoes. If this state is permitted to continue, an ulcer is formed.

The first object is to remove the cause; then to lessen the irritation and reduce the swelling. After soaking in hot water the nail should be thinned by scraping, and, if very painful, a flaxseed poultice will bring relief. After the irritation has sufficiently subsided, soft cotton should be pressed between the flesh and the nail, and after that is done it should be saturated with the tincture of iodine, and the application repeated several days, after

which the tenderness will disappear. It may be necessary to lift the end of the nail, and this can be done by pressing cotton between it and the toe.

Frequently, however, this is not sufficient, and then it is best to have it radically cured by taking away a strip of the nail at the side and scraping the matrix beneath. Then there is no further growth of nail over the small denuded portion, and it cannot press into the skin.

Varicose Veins.

Varicose veins occur in various parts of the body, but most frequently in the lower extremities, and are always due to an impediment which obstructs the return circulation. They are always the result of considerably prolonged strain on the vessels, growing worse from year to year if the cause is continued, and for this reason are most troublesome as age advances.

The return circulation from the leg is aided most of all by alternate contraction and relaxation of the muscles of the leg. Persons whose employment is of an active sort are less likely to suffer than those who merely stand for long periods with little occasion for moving about. Those who are obliged to spend much time standing should especially avoid circular garters and all manner of wearing apparel which causes tightness or constriction at one part of the leg more than another.

As a method of prevention, loose clothing, especially the disuse of garters, and a certain amount of physical exercise, particularly walking, are to be recommended. Early on the appearance of enlarged veins of the leg, the use of an elastic stocking, or even of a tight stocking of the ordinary kind which fits tightly from the toes to the calf will often be found sufficient to overcome the condition, provided the original cause is removed. Instead of the elastic stocking a cotton or flannel bandage may be used. It can be applied on arising and removed at bed time, and it should reach from the toes to the knee or higher. Persons whose occupations keep them at home may often largely overcome the condition by occasionally lying down for a few minutes during the day, by which means the overdistention of the vessels is temporarily relieved. In this manner the overstretched muscle-fibres in the walls of the vessel also have opportunity to recover their contractility.

In severer cases the elastic stockings made especially for the purpose may be worn on alternate days or weeks. It is rarely desirable or necessary to use them continuously.

Ganglion.

By this term is meant a small sac containing a thick, clear fluid attached to a tendon sheath or to some joint. It is common on

the back of the wrist, usually forming a small rounded lump, but sometimes where multiple, more of a flat excrescence. It is not at all serious, rarely becomes inflamed, and even if left alone rarely causes any more trouble than slight pain and feeling of weakness.

The simplest and best treatment is to burst the sac by pressure, and so disperse the contents into the cellular tissue. Put one thumb over the swelling, and the other thumb over the first, and press firmly until the wall gives way. Then knead it well until all the contents are expressed. Afterwards apply firm pressure. First apply a piece of lint about the size of the ganglion, then one a little larger, then another a little larger until a sufficient pad is formed. Cover with a penny or small piece of wood or metal, apply a firm bandage, and leave it on about a week. In many cases this results in a cure; in some, it recurs. The same treatment may be tried a second time, but if again unsuccesful, it is advisable to have an operation.

Whitlow.

Many a finger, and even hand, has been saved by wise and timely treatment of a whitlow, or "gathered" finger. From varous causes the point of the finger becomes inflamed and begins to throb and swell, and indicates the formation of matter under the nail.

The finger may have been punctured somehow and poisoned with dirt, or the nail cut too close to the quick. When heat or throbbing are felt, the point of the finger should be held in hot water and poultices applied, but not for too long, as the formed matter accumulating may burrow and press inwards till the tendons of the finger are completely destroyed, and the bones also. This may ultimately spread to the palm of the hand, till disorganization of the whole hand may necessitate amputation of it. As soon as any matter is known to be forming there, the only safety is in the free incision of the knife into the fleshy part of the finger point. Delay is very dangerous here.

Cold-Sores.

A fever-blister or cold-sore (herpes is the scientific term) is in the nature of a blister, but it is deeply-seated, so that the wall is thicker and tougher than that of an ordinary blister, such as that which follows a burn, for example. There is a feeling of heat or burning for a while preceding the eruption, and then the finger, instinctively drawn to the lip by the uncomfortable sensation, feels a hard, elastic elevation, made up of one or several closely aggregated blisters from the size of the head of a small pin to that of a pea.

If not scratched, the blisters do not break, because their walls are so thick, but gradually dry up and form thin crusts which, if

not molested, will finally drop off and leave sound skin beneath. If scratched or picked the blister may be broken or the scab removed too soon, and then a very sore spot will remain for some days, or a deep and persistent crack in the lip will be formed.

Mopping a cold-sore every ten or fifteen minutes with cologne water, or better, spirit of camphor, will dry it up quickly. After the scabs have formed, camphorated vaseline or zinc ointment may be applied three or four times a day. Care should be taken not to pick at the blisters, otherwise they may be converted into troublesome and painful sores.

If herpes occurs in frequent attacks the digestive system is probably at fault, and the family physician should be asked to set it right.

Superfluous Hair.

Many people are troubled with hairs which occur where they are not usual, or, to put it with absolute accuracy, they are large where normally hairs occur in an undeveloped state. This is, perhaps, most usually the case to a troublesome extent on the upper lips of young women. They are conspicuous especially in dark women, where the hair is black. The simplest treatment for the removal of the hairs is clipping with a sharp pair of scissors, and it is one of the best methods, too. Then there is the method of removal by means of the razor, and pastes which effectually destroy the hairs just as they leave the skin. These methods are all defective in this, that they are only temporary ; and the latter methods (the razor and pastes) have the further disadvantage that they have a direct effect on the skin. This is especially the case with the chemical paste, for it acts on the skin as surely as it does on the hairs, and the natural smoothness and delicate surface which is present in the young, and especially the young of the female sex, is destroyed. There is one other method which is effective—electrolysis—but it is troublesome and expensive. A needle is passed along the hair which is to be destroyed ; it is connected with the current from a battery when the hair has been selected ; it is passed down to the root of the hair ; the contact is made so that the current passes through the bulb of the hair, to its destruction. This is a delicate operation,

and each hair has to be treated separately, which makes it tedious and expensive. Its effectiveness, too, varies with the skill of the operator, and it sometimes is the cause of small scars where the hairs have been, and these, of course, are unsightly.

Cold Bathing.

The application of cold to the surface of the body by means of the bath is a powerful agent, the value of which in the treatment of disease as well as in the preservation of health is being increasingly realized.

The action of a cold bath (from fifty to sixty degrees) is stimulating and tonic. It acts powerfully upon the nervous system, making the nerves more prompt in their response to the needs of the organism, and freshens the mental faculties to a wonderful degree. It banishes the dull and listless feeling which one who is not in the robust health of youth is so apt to experience on first getting out of bed. It exercises and strengthens, also, the muscular walls of the arteries, upon the normal action of which the proper distribution of the blood throughout the body in great measure depends.

The first contact of the cold water with the body causes a sharp contraction of the blood-vessels of the skin, as shown by the pallor of the surface ; but as soon as one leaves the bath the arteries dilate, the skin becomes pink and a warm glow is felt that amply compensates one for the disagreeable shock of the first plunge.

This flushing of the surface which brings with it warmth and a sensation of vigour and well-being, is the test which shows that the bath is doing good. If this reaction does not occur, and one feels cold and depressed, and the skin remains of a bluish hue, it is a sign that the bath is harmful, and then one must be content with a cool sponging, followed by a brisk rub with a coarse towel. After starting in this way, and after consultation with a physician, it will generally be possible to proceed cautiously to the shower or tub bath. Elderly people and those who react badly can often take a cool sponge bath while standing in warm water half-way to the knees.

The devotee of cold bathing seldom suffers from cold in the head, provided, of course, he does not violate the ordinary laws of hygiene as regards eating, sleeping and ventilation ; and if he does take cold, he is in condition to throw it off before it invades the bronchial tubes or lungs. Sufferers from poor circulation, which shows itself by cold feet and icy fingers, are benefited by the morning cold bath, and this, in the case of one who habitually has cold feet, may be profitably supplemented by a cold foot-bath at bedtime, followed then, as always, by the brisk rubbing with a coarse towel.

Offensive Perspiration.

Although the feet are the most usual site of this troublesome condition, it is not confined to that place, but occurs in all parts of the body where hair grows, and at a few other places, such as the palms of the hands.

It occurs very frequently in the armpits, and it is not uncommon to find that it causes the destruction of delicate clothing in that region. This is so common, in fact, that special protection is made to prevent its occurrence. To avoid this pestilent condition it is necessary to take frequent baths in warm water, softened by the introduction into it of some soda or ammonia, special attention being directed to the regions affected by the perspiration. Then, too, it will be necessary to bathe the parts with some antiseptic, such as formaldehyde (40 per cent.) solution diluted ten times. It will be found that very soon all the odour will disappear from the affected parts. The dusting with boracic acid powder each morning may be added to the use of the formalin, or it may be substituted for the washing with formalin.

Moist and clammy hands should be treated on exactly the same principles as the armpits and feet. Careful washing with softened water to get rid of the accumulation of sweat, followed by washing with formalin; and then the boracic acid powder should be dusted into the gloves, and they can be worn at night if the employment prevents their use during the day. When it is possible they should be dusted before being worn during the day also. It is most important that these precautions should be taken with care and patience for a time, so that the action has a chance of being radical.

The internal use of pure sulphur—one-half to one teaspoonful in milk after meals—is often beneficial in these cases.

Scabies or the Itch.

Scabies or the itch is an ancient and familiar foe of the people. A small insect makes an entrance through the skin, burrows its way just underneath, like a miner, takes up its residence, and lays its eggs without ever dreaming of paying rent. The effect of this is to raise, first, a watery pimple, which becomes a yellow head from the formation of a little matter. An intolerable itching is the result of this tenant's sojourn, especially when the body gets warm. Wild scratching is induced, which inflames and tears the skin. It is often difficult to tell this condition from eczema, but if a pimple is carefully explored by means of a magnifying glass the mark of the line of tunnelling will be detected. Besides, the fact of more than one in a household being almost always affected at the same time will assist the distinction. The

skin between the fingers, the front of the wrist and thighs and chest are the favourite hunting grounds of this explorer.

The whole object of treatment is to stifle and poison the wretch in his hiding place. This is simply done in this way. A warm bath is taken in the evening, when the skin is to be well rubbed with soap. Then compound sulphur ointment is rubbed and pushed thoroughly into the skin, allowed to remain on all night, when another bath is taken and quite clean clothes put on. The dirty clothes must be most effectually boiled and washed with carbolic soap before being again used. This may have to be repeated, but it is all important that every egg on the clothes be killed.

Hives, Nettle Rash or Urticaria.

During warm weather the conditions are favourable for the appearance of a very common yet most annoying minor ailment. Hives is the popular name for a form of cutaneous eruption to which some people are very susceptible, and which is more elegantly known as nettle rash or urticaria.

It shows itself as raised, red or pale patches, varying in size, which appear on the skin of a part or the whole of the body and give rise to great discomfort through the burning and itching they cause. These may be the only symptoms and the trouble may disappear in a few hours ; or in rare cases there may be evidences of severe constitutional disturbances, as shown by high fever, headache, coated tongue, loss of appetite, great thirst, nausea and vomiting.

The treatment for the mild cases consists in light diet and laxatives, together with the attempt to discover and avoid the cause of the trouble. For the itching, alkaline baths, cooling and astringent lotions and dusting powders will give relief. The temptation to scratch the affected region should be resisted as much as possible, as it only aggravates the condition. In many cases painting with a strong solution of carbolic acid, 1 in 20 of water, gives great relief.

Eczema.

Eczema is an inflammation of the skin which, when typical, shows masses of vesicles which burst and leave a raw surface, discharging a serous fluid that stiffens as it dries, but, when not typical, it presents an extremely variable appearance. Itching is always present and is frequently severe. When very acute, the itching becomes a burning, smarting pain. It is found at all ages, but especially in infants and old people, and may attack any part of the body. In old people, in consequence of poor circulation, the legs are most commonly affected, especially about the ankles,

The combination of dampness with exposure to cold weather is a very common cause of eczema and of keeping it up when it once occurs.

As regards treatment, acute eczema requires free purging with Epsom salts and the local application of dressings soaked in boiled water or in lead lotion, which must be changed frequently and kept wet.

The subacute or chronic cases are more difficult to cure. Stimulants of all kinds must be avoided, the bowels kept regular with saline purgatives, and the local treatment must be carefully attended to. The crusts should be removed by soaking with oil for a couple of hours, then a bread and water poultice applied. Ointments, when used, are best spread on gauze or linen and laid over the area. In very chronic cases a stimulating ointment such as citrine ointment is required. Where the circulation is weak it must be improved by tonics, and varicose veins supported by bandaging every morning, removing the bandages at night.

Psoriasis.

Psoriasis is a skin disease of very obscure origin. It begins with little scaly spots which appear as if a piece of mortar were dropped upon the skin, and when the scales are picked off, a red surface is left from which oozes a drop of blood. The spots increase in size and number, or in other cases they remain in a few large masses upon the knees and elbows. Irritation of some sort, such as an attack of indigestion, or alcoholism, or fever, seems to act as the main cause.

The treatment aims at stimulating the general condition of the skin so that the affected areas are replaced by healthy skin. The most commonly employed method is to wash off all the scales with an alkaline lotion such as a solution of bicarbonate of soda or ammonia, and then apply an ointment of fifteen to thirty grains of chrysophonic acid to an ounce of vaseline. The washing and application should be repeated every night, and it is advisable to wear old underclothing and wear it continuously, as it will be destroyed by the ointment. Internally, Fowler's solution of arsenic is required in increasing doses. Begin with five drops in a glassful of water three times a day after meals, and increase the dose by one drop every second day until ten drops, or even more, are being taken.

Usually this treatment is effectual in two or three weeks' time and the rash disappears perhaps for years, perhaps only for a short time. Each time that it comes back it is more difficult to cure. In some cases it is only kept under control, not removed entirely.

DISEASES OF CHILDREN

Croup.

Croup is inflammation of the larynx, or laryngitis, in young children. After a little cold in the head, or after getting wet, the child wakens up in the middle of the night with a rough cough, hoarse voice, and some difficulty in breathing. The remedy for this is to apply promptly around the neck a cloth wrung out of cold water, changing it frequently. Also moisten the air of the room by having a kettle of water boiling in it. If the difficulty of breathing is severe, cause vomiting by giving one-half to one teaspoonful of wine of ipecac, followed by a cupful of lukewarm water. After working with the little one for an hour or two he usually settles to sleep again, to have perhaps another less severe attack the next night, but in a few days he is quite well again, indeed in the daytime there seems to be nothing wrong. This serves to distinguish the case from membranous croup, which is really diphtheria of the larynx.

Summer Complaint or Infantile Diarrhœa.

Summer complaint or infantile diarrhœa is a very serious matter with babies passing through their first summer, particularly if they are artificially fed. It is mainly caused by the heat, which is favourable to a tremendous increase in the number of bacteria both outside and inside the body. In this way the food is apt to be spoiled, the milk soured, and so rendered unfit for use. Overfeeding babies is another common cause, the food being given too much at a time and too frequently. So many mothers have the mistaken idea that baby must be fed every time he cries, or to quiet him he is given one of those abominable rubber nipples to suck at continually. In this way the salivary glands and stomach are kept continually irritated and digestion spoiled.

Infantile diarrhœa usually comes on with an attack of vomiting, followed by frequent profuse watery motions, which rapidly prostrate the child, indeed in twenty-four hours a fat baby may become quite emaciated. Afterwards the motions become less frequent and green and slimy, and if the child escapes the first acute stage he is apt to succumb in the long-continued less severe diarrhœa and indigestion that follows.

The treatment demands first a purgative to remove completely from the system all the irritating undigested material, and for this purpose castor oil, one full teaspoonful, is best, because it acts cer-

tainly and has a subsequent constipating effect. At times, however, the stomach will not retain it. Then calomel may be given in one-tenth grain doses every half hour till one grain is given. After the purgative, the best remedy is bismuth, which is mildly astringent and antiseptic. It is a heavy powder, difficult to give as a powder, and hard to keep in suspension in a liquid. The following when well dispensed acts well: Subnitrate of bismuth, two drachms: glycerine of tragacanth, two drachms; water to three ounces. Mix. Give one teaspoonful every two hours. This makes the motions almost black in colour.

At the onset of the trouble all food and liquids should be withheld while the vomiting is going on. Then begin by giving albumen water made by mixing the white of one fresh egg with five to six times its bulk of boiled water. Stir the albumen gently with the water and add a pinch of salt. Give one teaspoonful every few minutes. In twenty-four hours or so some more food may be given such as barley water, rice water, or even milk well diluted with boiled water, and with lime water added. If modified milk mixtures can be obtained these may be used.

The extremities of the child must be kept warm by the use of a hot water bottle if necessary, but baby must be kept in the fresh air and the coolest place possible. It is in such cases that a change to the country or seaside is so beneficial for the little ones.

Care of the Children's Teeth.

Parents are too apt to neglect their children's teeth. They know that they are bound to drop out in time whatever care is taken of them, so it seems foolish to fill them or take any special pains to make them last. But there is many a misshapen mouth that bears witness to the fallacy of that reasoning. The milk-teeth are needed to keep a place for the permanent teeth, and if they are lost prematurely the jaw will not grow properly, and the new teeth will be so crowded that they must turn sidewise or be forced out of line. Furthermore the child's food must be masticated as well as the grown person's if he would be saved from a life of dyspepsia. And finally, for the sake of the permanent teeth, the child should early form habits of mouth cleanliness.

When teeth come they should be cleaned regularly with a soft cloth and warm water, and as soon as the child is old enough he should have a little tooth brush and be taught how to use it twice a day. This will help to keep the tender teeth from decay, but more than that, it will inculcate in the child the virtue of mouth cleanliness, and teach him hygienic habits which will stand him in good stead his life long.

If, in spite of care, the milk-teeth begin to decay, they should not be extracted, but should be filled, so as to keep them from falling until the permanent teeth are ready to protrude. The child's mouth should be examined by a dentist once or twice every year so that the tartar may be removed, and any spot of beginning decay may be detected and treated.

Growing Pains.

There are no "growing pains." Growth is a normal process, and like other normal processes is carried on in health without pain or discomfort. Pain, no matter when or where it occurs, is always a danger-signal, a cry that something is wrong, and its warning must not be silenced by calling it names.

There are two sorts of pain which are more commonly than others called "growing pains," often to the lasting injury of the child. The first of these is felt chiefly in the knee. The child is usually thin and pale, and is likely to be tall for his age. Perhaps he limps at times without being conscious of pain. The suffering is frequently worse at night. This trouble may be a beginning of hip-disease.

The other common variety of "growing pains" is seen in healthy-looking, well-nourished, red-cheeked, active children. In such cases the pains are usually in the muscles of the arms or legs, although sometimes in a joint. These are very often, if not always, rheumatic.

A child should certainly not be encouraged to run to its mother with every little ache, but when it is evidently suffering from severe, persistent or frequently recurring pains, it should be examined by the doctor.

Nocturnal Enuresis.

The number of young people troubled with nocturnal enuresis, or bedwetting, is great, and it can be easily understood that there follow in its train much distress, discomfort and damage. The parents often regard the habit as a bad and dirty one, but it must be remembered that it arises from a diseased condition of the bladder and its nervous mechanism, and that the child is no more responsible for it than he is for breathing. There is very often no discoverable tangible cause for it, although intestinal worms are often the guilty parties, but as a rule the cause of it lies in an enfeebled state of the nerves and muscular fibres of the bladder itself. Too acid urine from improper feeding and consequent indigestion may sometimes be to blame.

The most effective way to deal with it is to give tincture of belladonna, which has an excellent tonic effect upon the bladder. Children can stand wonderfully large doses of this useful drug, much better indeed than grown-ups. For a child of under eight years, five drops may be given afternoon and bedtime for a week; then for the next two weeks eight drops may be given; and for a couple of weeks further, ten drops, and if the case is mending the dose should be steadily diminished. But it should not be given up for some time after the infirmity has disappeared. In the case of a child between eight and fourteen years, the dose may begin at eight drops and increase in the same proportion as the other. Above fourteen years the dose should be the same, but it should be given three times a day. Sometimes the belladonna is not efficient, in which case strychnine tablets or tincture of nux vomica should be given under the advice of the attending physician. It is often very helpful to strengthen the child by means of quinine and iron, Peruvian bark, and syrup of hyposphites, and even cod liver oil and malt. A dose of bromide of potassium at bed time is often requisite, from ten to twenty grains according to age. The child should not be allowed to sleep on his back, and a scarf or towel with a big knot in it should be secured around the waist. When the mischief arises from worms or acid indigestion the trouble must be removed by appropriate treatment.

Rickets.

This is a disease of young children, most marked from six months to two years of age, caused by poor food and unhealthy surroundings. It shows its effects particularly in the bones, which become soft and give way under the weight of the body or of muscular movement. As a result many deformities are produced, especially of the legs, chest, head and back.

Children with rickets may be heavy, but they are pale; the muscles are soft and flabby, the appetite changeable, they are fretful and usually perspire at night, especially about their heads. Convulsions occur very easily in rickets.

The treatment is essentially dietetic and hygienic. The children should live in the open air as much as possible, and when indoors be in clean, sunny, well-ventilated rooms. Food, especially fresh milk, meat juices and fresh fruits, such as orange juice, may be given in smaller or greater quantity according to the age of the child.

Bow-Legs.

This is one of the commonest of deformities in childhood, and is by no means rare in later life. It seldom begins after the age of six or eight years, although older youths may acquire a greater or less bow of the legs from excessive horseback exercise, and a fracture of one or both legs or disease of the knee-joint may result in the deformity. A baby may be born with bow-legs, as it may be born with club-feet, but the trouble is seldom noticed until the child begins to walk. Then, if the bones are soft as a consequence of rickets, the weight of the body causes the legs to bend, and at the same time the ligaments on the outer side of the knees usually yield, increasing the outward bow.

There is a current popular belief that a child will grow out of his bow-legs, and for that reason treatment is often neglected, to the little patient's detriment. It is true that there is a natural tendency to spontaneous straightening of bowed legs, but the tendency is frequently thwarted by the weight of the child. It is better, therefore, never to depend upon nature's healing efforts, but to assist these and accelerate them by properly conducted manipulations, which are made just as one would straighten a bent stick. The mother should carry them out under the doctor's instructions at regular hours three or four times a day. The child ought also to wear properly-fitted braces to support the legs, and especially the knees, while it stands and runs about.

Crooked Backs.

There is hardly any greater deformity than a very marked lateral curvature of the spine. It is worse than the humpback due to actual disease (Pott's disease) of the spine, for it is moreirregular. There is a great projection to one side in the main, or primary curve, which usually throws one shoulder outward and upward. The neck above and the back below curve to the other side, and the hip on the side of the main hump also projects in an ugly way.

Fortunately, few cases go on to this excessive degree, but all cases may, once the mis-shaping has begun ; hence the vital importance of preventing the start.

Most cases of lateral curvature begin in school children, and

are started by bad habits in the way of sitting at the desk, especially when writing. Or the child may get it by simply tilting the head habitually to one side as he works at his desk. This is sometimes the result of faulty desk or lighting, or may be due to a defect of sight. Carrying of weights on one side is another cause of lateral curvature. School-boys are not in much danger, for they carry books swinging from a strap; but the more sedate girl often carries hers in a bundle resting on one hip or in the crook of the elbow. Errand boys who carry heavy baskets may become deformed in the same way.

These errors should be watched for and corrected, and children kept in the open air at healthy play, where all the muscles do their equal share.

Convulsions.

Two things are necessary for the occurrence of convulsions; first, an unstable condition of the nervous system,—the predisposing cause,—and secondly, some exciting cause sufficient to disorder the weakened nerve-centres. The instability of the nervous system is more pronounced in children than in adults, and seems often to be hereditary, the members of certain families being more prone to fits than others.

Certain chronic diseases of nutrition, such as rickets, are associated with an irritability of the brain and spinal cord, and convulsions are peculiarly frequent in children suffering from such diseases.

Convulsions in children are very common at the outset of one of the acute fevers, such as scarlatina or measles. At that time the convulsions have no special significance, but when occurring later during an attack of scarlet fever, they may point to the existence of kidney disease. In whooping-cough convulsions are sometimes produced in consequence of deficient aeration of the blood, owing to a partial collapse of the lungs.

In children convulsions are perhaps most commonly the result of some disorder of the digestive tract, caused by the presence of indigestible material in the stomach or bowels, or of intestinal worms.

Inflammation of the ear is another common exciting cause of convulsions, but teething, which is blamed for so many fits, very seldom causes convulsions, unless the eruption of the teeth is exceedingly difficult and painful.

In children, as in adults. convulsions may be due to hysteria or to epilepsy. They may be caused by a great shock to the nervous system, such as a severe fright. Meningitis or a tumour of the brain may also cause them, both in children and in adults.

When a child has a convulsion it indicates that there is too much blood going to the brain, a temporary congestion, and the first aim is to relieve this. For this purpose immerse the child up to the neck in a warm bath, and apply ice or cold cloths to the head. This dilates the vessels of the surface and takes away the blood from the brain. In the excitement frequently the water is too hot, and children have been scalded to death. The best method to test the water is to hold the elbow in the water for two or three minutes.

In addition to the bath the bowels must be at once emptied. For this give an injection of one teaspoonful of glycerine and a pint of warm soap-suds, and also a purgative by mouth, castor oil or calomel being the best. If in spite of these measures the convulsion persists, it may be necessary to give inhalations of chloroform to control it.

To prevent recurrence, give to a child a year old one grain of chloral and two grains of bromide of potassium dissolved in sweetened water, every three hours for four doses.

It is always advisable to call in the family physician as soon as possible in any convulsive seizure, as sometimes very sad results follow from injury or hemorrhage into the brain. The worst of these are incurable idiocy or paralysis. Also the physician is needed to try to ascertain and cure the cause in the particular instance.

Fever.

Fever is only a symptom of a large number of affections. As it often develops suddenly and without other symptoms, a mother should know some simple plan of treatment which may do good and cannot work harm, and which she may employ before the physician arrives. First of all, the clinical thermometer should always be used to determine whether or not there really is fever.

A moist skin and cool hands are not always a sign of the absence of fever any more than hot head or hands are a positive sign of its presence. A feverish child has usually little appetite or power of digestion, and food should be withheld or be of the lightest kind. Milk is the best thing under most circumstances, or some such article as milk-toast, junket, arrowroot, or light broth.

If food is vomited the child should have no nourishment at all. A good laxative, such as a full dose of magnesia or castor oil is always admissible, and a fever mixture like the following may be given : Sweet spirits of nitre, a drachm and a half ; citrate of potassium, thirty grains ; syrup of lemon, four drachms ; water to make two ounces. A teaspoonful every three hours at one year of age.

Confinement to bed is desirable. Other children should be

kept away, both for the sake of quiet and to avoid danger of contagion should an infectious disease be beginning. A warm bath is often given to "bring out the rash," if it is an eruptive fever starting. If fever persists and no perspiration has occurred four or five hours after the bath, the extra wrappings may be removed and the covering made as light as is comfortable to the patient. The abnormal heat of the skin makes the thickness of covering required less than in health. The child may have water to drink, cool, but not iced, freely in any reasonable quantity. Mothers err greatly in refusing to give a thirsty child water. Bathing of the head with bay rum is always permissible, if it does not produce chilliness. A cold, wet cloth may be laid on the head if headache is severe.

Infantile Paralysis.

In its early stages this is an acute febrile disease of childhood, and seems not a serious ailment ; but the paralysis may be lifelong and shockingly crippling. For this reason it is, to the physician who recognizes it in its early stages, one of the most dreaded of all the ills of childhood except those which directly threaten life. The disease begins like most of the acute fevers of childhood, with an indisposition to play, loss of appetite, sometimes nausea and vomiting, headache, restlessness, muscular twitchings, or sometimes actual convulsions, and fever. The fever is seldom high, and at first the child does not seem to be very ill. The symptoms suggest rather a little digestive upset than a serious disease.

After a few days, sometimes earlier, the child is seen to be paralyzed, and the paralysis increases rapidly in extent, until sometimes the power of motion is abolished in both arms and both legs. But usually the muscles are not so widely implicated, and only one or two limbs, perhaps the leg on one side and the arm on the other, or maybe only parts of these limbs, are affected.

By this time the acute symptoms have generally subsided, and if it were not for the paralysis the child would be up and about again as usual. But the paralysis persists for a few days or weeks, and then gradually recedes, until only a comparatively small part of the original area involved remains permanently affected.

The disease is essentially one of children, and more commonly of boys, although young adults are occasionally attacked. The paralysis that remains is accompanied by atrophy of the muscles and retarded growth of the affected limb. When it affects the leg it is the most common cause of acquired clubfoot.

Although a complete cure is seldom or never obtained, there are few diseases which offer a greater reward for persistent treatment. At the beginning massage and electricity are of the greatest use,

and sometimes the persistent and scientific application of electricity will bring about a notable improvement even after years of paralysis, when the muscles seem wasted away to nothing.

Chorea or St. Vitus' Dance.

The name, St. Vitus' dance, is now popularly used to denote a milder form of irregular muscular movements, called in medical parlance chorea. The disease chiefly affects children, and almost always those who are anæmic and "run down" in health by long hours of study, insufficient or improper food, lack of outdoor exercise, sleeping in poorly ventilated rooms, or who are convalescing from some acute fever. It is so frequently associated with rheumatism that some physicians believe it to be simply one of the manifestations of that malady.

The first signs of the approaching trouble are usually seen in a change of disposition. The child becomes irritable and ill-natured, neglectful of its studies and indifferent to play. The appetite is poor and capricious. Candy, pickles and slate-pencils are preferred to roast beef and potatoes, and the nights are restless and disturbed by terrifying dreams.

After a period of this distressing state, in which the parents hardly know whether the child is sick or only naughty, the muscular twitching begins in one arm or the face. The eyes wink, the corner of the mouth is drawn up, the head is pulled to one side or backward, the shoulder is shrugged, the arm is bent or straightened irregularly, the hand jerks so that objects held therein may be thrown across the room.

The foundation of treatment is tonic and upbuilding. The child should be tempted to eat good, nourishing food with an abundance of milk, cream and butter. He should spend long hours out-of-doors, and should sleep in a room with open windows, under watch, if necessary, through the night to see that in his thrashing about he does not throw off the bedclothes, although usually the movements cease during sleep.

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