Correspondence.

Plea for a Government Perpetual Motion.

To the Editor of the Scientific American:

In your issue (date of May 21, 1881) under the above heading, you urge, concerning my experiments in the Washington Navy Yard, that "no more of the public money be wasted on such stupid and irrational schemes." For over two years I have, at great personal expense and sacrifice, conducted work, in which I volunteered, at the urgent request of the late Surgeon-General Woodworth, with a view to the disinfection of ships by artificial refrigeration. The complete demonstration of the engineering side of the problem enabled me to prove to the satisfaction of, probably, the ablest engineer officer of any navy, that a low temperature engine, such as enabled me to abstract heat from air or water more cheaply than had ever before been accomplished, might take the place of the steam engine for all ordinary purposes requiring motive power. A clear and profound knowledge of thermo-dynamics enabled Chief Engineer Isherwood to recognize the step in advance I had reached. Thereupon the Secretary of the Navy permitted me, *still entirely at my own expense*, to make detail modifications of the machine, which has worked successfully since the 20th of last December, in an investigation to determine the practical feasibility of my zeromotor.

Those who never try, never fail. I have been willing to risk money and reputation, with no fair prospect of reward, in an attempt to check the inroads of a disastrous plague. The researches which enabled me to succeed in this had indicated, from the very first, the steps which might be pursued in a promising attempt to supersede the steam engine. Nothing but experiment could settle the question, and again I was willing to run the risk of failure without calling on the government for means to demonstrate the truth or error of a system which may, as Chief Engineer Isherwood says, "prove of more importance to the Navy of the United States than to the navies of the great maritime powers of Europe, with which it may come in collision."

I court fair criticism, and have sought objectors. Since the summer of 1878 I have steadily pursued researches without publicity, until this, with regret, became necessary, in obtaining a privilege almost essential to their completion. It is hard to believe that any competent American engineer should know so little of the history of heat engines as to lead him, for one moment, to suppose that Mr. Isherwood could indorse a "perpetual motion." If one so distinguished as he, in this special department of knowledge, can be misrepresented and misunderstood, it is not surprising that one who has labored in other fields should be regarded as a dangerous innovator. Failure implies my loss; success, the Navy's and the world's advantage, infinitely more than mine.

I am, sir, your obedient servant,

JOHN GAMGEE.

Riggs House, Washington, D. C., May, 1881.

The Electrical Self-Acting Steam Engine.

To the Editor of the Scientific American:

I would call the attention of Messrs. Gamgee, Keely & Co., to the following extract from Helmholtz's "Popular Scientific Lectures." As soon as their present jobs are finished, which will doubtless be ere long, here is a promising field for mechanicians of their peculiar ability.

"A speculative American set, some time ago, the industrial world of Europe in excitement. The magneto-electric machines often made use of in the case of rheumatic disorders are well known to the public. By imparting a swift rotation to the magnet of such a machine we obtain powerful currents of electricity. If these be conducted through water, the latter will be resolved into its two components, oxygen and hydrogen. By the combustion of hydrogen, water is again generated. If this combustion takes place, not in atmospheric air, of which oxygen only constitutes a fifth part, but in pure oxygen, and if a bit of chalk be placed in the flame, the chalk will be raised to its white heat, and give us the sun-like Drummond's light. At the same time the flame develops a considerable quantity of heat. Our American proposed to utilize in this way the gases obtained from electrolytic decomposition, and asserted that by the combustion a sufficient amount of heat was generated to keep a small steam engine in action, which again drove his magneto electric machine, decomposed the water, and thus continually prepared its own fuel. This would certainly have been the most splendid of all discoveries; a perpetual motion which, besides the force that kept it going, generated light like the sun, and warmed all around it. The matter was by no means badly thought out. Each practical step in the affair was known to be possible; but those who at that time were acquainted with the physical investigations which bear upon this subject could have affirmed, on first hearing the report, that the matter was to be numbered among the numerous stories of the fable-rich America; and indeed a fable it remained." (Page 165.)

Possibly Mr. Isherwood would be benefited by reading the whole essay. G. M. P.

The New Testament.

The first and authorized edition of the revised translation of the New Testament was published simultaneously in all English speaking countries May 20. There were sent to this country from the Oxford and Cambridge presses, 400,000 copies.

The Ammonia Jelly Motor.

To the Editor of the Scientific American:

I have invented a new engine to which I desire to call your attention and the attention of Professors Gamgee, Keely, and other gentlemen who can elevate themselves by lifting at the band of their breeches.

From a bottle filled with anhydrous ammonia, of the thickness of good jelly, by a pipe there is communication to a cylinder. I set the bottle in a basin of rain water. The latent heat of the water liberates the latent heat of the ammonia, which is thereby expanded into vapor, and passes into the cylinder, forcing the piston forward. Its further expansion to fill the space behind the piston—being work done—occasions a loss of heat, and with the loss of heat the vapor is condensed again to cream or jelly, and runs out by an exit port into another bottle. The second bottle stands also in a basin of rain water, and the latent heat of which again vaporizes the anhydrous cream—ammonia, I mean—and it is carried thence to the further side of the piston, which is then forced back to its original position, the expansion (after cut off) again condensing the vapor and preparing it to flow back to the first bottle. By connecting rods and crank the piston actuates a belt wheel, and that the machinery of the shop.

But I find that a curious result obtains. For if the ammonia expands and condenses, and after filling a large space immediately puts itself into a very small portion of the same space, thereby leaving a *vacuum* which is *filled* with something (possibly a "vibratory force," similar to Keely's new trick), I find that it will run back and forth between the two bottles, without the intervention of the cylinder and piston. Hence I discard the machinery, and set two bottles of "anhydrous ammonia," or any other "condensed liquefiable gas of adequate tension," directly under the flywheel, with a bit of bent tube running from one bottle to the other.

The only difficulty about the invention is that it don't work any more usefully than any other form of perpetual motion, and yet the principle, divested of technics, is just as sound as the principle of Gamgee's zeromotor, while at the same time my invention has a more appropriate name—the nomoter.

A. F. HARVEY.

Kirkwood, Mo., May, 1881.

"Zeromotor."

In our younger days we were told "that if the heavens should fall we could all catch larks," as true now no doubt as then, but before disposing of the larks it may be well to consider the likelihood of having such an opportunity to catch them. Concerning the "zeromotor," about which, of late, there are so many visionary speculations, it would seem that a moment's consideration of the facts pertaining to the vaporization and liquefaction of the condensible gases would satisfy any one that the scheme was altogether chimerical. In the vaporization of condensible gases heat is absorbed which *must* be discharged before liquefaction can be effected.

Inasmuch as the specific heat of a given weight of gas does not vary with any change of volume, it follows that liquefaction is *not* caused by *expansion*, and to abstract the latent heat of vaporization without compression some condensing medium must be provided, having a temperature *below* that of the expanded gas. The boiling point of ammonia at atmospheric pressure being 30° below zero of the Fahrenheit scale, it is not at once discoverable where a condensing medium of lower temperature is to come from. Without it liquefaction does not take place, the cycle is incomplete, and this beautiful theory vanishes in thin air. Once prove that complete liquefaction follows expansion, and we not only have perpetual motion but a perfect *ice machine*, which once set in motion would produce ice and give off power to the end of time, and would require an act of Parliament *limiting* the hours of continuous working, otherwise we might confidently anticipate the commencement of another Glacial Period.—*J. K. Kilbourn, in Engineering.*

Perpetualmotion.

DEAR SIR: I have Invented a Machine that has been worked upon for the last Centuries and is called *Perpetualmotion.*

I am a young man, with out Money or Friends to lend me Money. Now how can I get money for a Patent and other expenses. I cant give Security as I have nothing. I wish to ask Several questions concerning a Patent. In the first place what can I get a Patent on the word Perpetualmotion. Now for instance I will say Electrisity now we have Electrisity and there is no Patent on it and there can not be gotten any on it. Now if Perpetualmotion was made with Electrisity could I get a Patent on the word Perpetualmotion and Manufacture 7 or 8 differant kinds stiles of Machines in the line of Perpetualmotion with the one Patent. Or can I get a Patent on it that it is the only machine that is Perpetual and Manufacture the different kinds with the one Patent I wish to ask if you would Publish an Article in your Paper that it would strike some Capitalists Eye who would forward me the money and I would give him a share in the buisoness. I have no money to Pay for this Insertion but I hope to do something for your Paper by Advertising and obtaining other Patents of which I have about 60, of which I keep account in a Book. As I say I have no Money and you know as well as I do that with out Money I can do nothing. One more and the last question. does not the Goverment offer a Reward to the Inventor of this Machine. If you would Please answer these questions through letter or your Paper. And Oblige A Subscriber. Address H. C. B. Will be called for at Post Office St. Louis Mo. For any Information or Enquiries Address the Above.

Gymnastics as a Cure of Disease.

Physical vigor is the basis of all moral and bodily welfare, and a chief condition of permanent health. Like manly strength and female purity, gymnastics and temperance should go hand in hand. An effeminate man is half sick; without the stimulus of physical exercise, the complex organism of the human body is liable to disorders which abstinence and chastity can only partly counteract. By increasing the action of the circulatory system, athletic sports promote the elimination of effete matter and quicken all the vital processes till languor and dyspepsia disappear like rust from a busy plowshare. "When I reflect on the immunity of hard-working people from the effects of wrong and overfeeding," says Dr. Boerhaave, "I cannot help thinking that most of our fashionable diseases might be cured *mechanically instead of chemically*, by climbing a bitterwood tree or chopping it down, if you like, rather than swallowing a decoction of its disgusting leaves."

The medical philosopher, Asclepiades, Pliny tells us, had found that health could be preserved, and if lost, restored, by physical exercise alone, and not only discarded the use of internal remedies, but made public declaration that he would forfeit all claim to the title of a physician if he should ever fall sick or die but by violence or extreme old age. Asclepiades kept his word, for he lived upward of a century and died from the effects of an accident. He used to prescribe a course of gymnastics for every form of bodily ailment, and the same physic might be successfully applied to certain moral disorders, incontinence, for instance, and the incipient stages of the alcohol habit. It would be a remedy *ad principium*, curing the symptoms by removing the cause, for some of the besetting vices of youth can with certainty be ascribed to an excess of that potential energy which finds no outlet in the functions of our sedentary mode of life. In large cities parents owe their children a provision for a frequent opportunity of active exercise, as they owe them antiseptic diet in a malarious climate.—*Dr. Felix L. Oswald, in Popular Science Monthly.*

Separation of Nickel Oxide and Cobalt Oxide.

The author proposes to give a process for the separation of the two metals, derived from two known methods, and permitting the exact determination of the two oxides, and the preparation of the two metals in a state of purity. The two fundamental processes are that of Pisani, who uses caustic potassa in presence of an ammoniacal liquid, in which are dissolved the two metals, with exclusion of air. The nickel oxide is precipitated alone in bulk, but always carries down with it more or less of cobalt oxide. The second method is that of Terreil, who precipitates cobalt in an acid solution in the state of roseo-cobaltic hydrochlorate. The cobalt oxide is peroxidized by means of permanganate. We suppose that the two bodies, cobalt and nickel, have been obtained by known methods, either as pure oxides or pure sulphides, free from all foreign matter. The mixed oxides or sulphides are dissolved in an aqua regia containing a large proportion of hydrochloric acid. The solution is largely diluted with water and saturated with ammonia in excess. Permanganate is then added until the solution remains rose colored for some time. Pure potassa is then added, when the nickel is precipitated as hydroxide, carrying with it manganese oxide, derived from the permanganate. The precipitate is washed by decantation and filtered, redissolved in hydrochloric acid, and treated again with ammonia, permanganate, and caustic potassa. The washing waters which contain the cobalt are collected, saturated with acetic acid, and precipitated by sulphureted hydrogen. The mixture of nickel and manganese oxides is redissolved in hydrochloric acid, and the solution saturated with ammonia. The solution is exposed to the air for some time, and the manganese oxide is by degrees entirely precipitated. It is filtered off, the filtrate is saturated with acetic acid, and the nickel thrown down by means of sulphureted hydrogen. The process may be employed on the large scale for obtaining nickel completely free from cobalt.—*G. Delvaux.*

The American Medical Association.

The thirty-second annual session of the American Medical Association was held in Richmond, Va., the first week in May. More than five hundred delegates were present from all parts of the country. Dr. J. T. Hogden, of St. Louis, presided, and many valuable papers were read. The officers chosen for the ensuing year were:

President: J. J. Woodward, of the United States Army. First Vice-President: P. O. Hooper, of Arkansas. Second Vice-President: Laertes Conner, of Michigan. Third Vice-President: Eugene Chisolm, of North Carolina. Fourth Vice-President: Hunter McGuire, of Richmond. Secretary: William B. Atkinson, of Pennsylvania. Treasurer: L. J. Dunglison, of Washington, D. C. Chairman of the Committee on Arrangements: A. J. Stone, of Minnesota. Vacancies in the Judicial Council were filled by the appointment of Dr. S. N. Benham, of Pennsylvania; Dr. J. M. Jones, of the District of Columbia; D. A. Linthicum, of Nebraska; William Brodie, of Michigan; H. D. Holton, of Vermont; A. B. Sloan, of Missouri; and R. B. Cole, of California. St. Paul, Minn., was selected as the next place of meeting.

Interesting Discoveries in Yucatan.

In Yucatan some discoveries have been made, of a very interesting character, mainly by Dr. Le Plongeon, the agent of the American Archæological Institute, who has excavated the ruins of Mayapan, once the capital of the Mayas, a powerful tribe among the aboriginal inhabitants. The later history of this important town is well known; for less than a century before the arrival of the Spanish invaders, the king of the tribe had been murdered by his nobles, his followers dispersed, and the royal city destroyed, so that the objects brought to light by Dr. Le Plongeon's exertions find their place immediately as historical documents. Among other things, portrait sculptures of the unfortunate king have been discovered, which are at once recognized as similar in face and figure to bass-reliefs at Chichen-Itza, the metropolis of Yucatan, where the lords paramount of the country held their court, and where the king of the Mayas is represented as doing a sort of homage to his suzerain. This coincidence seems to point to a period of special artistic development throughout that region, when pictorial or sculptured representations of the affairs of daily life had become somewhat habitual. Further proofs of enlightenment are found in astronomical instruments, such as stone dials of accurate workmanship, which were found still standing on a smooth platform of stone, covered only with a few inches of vegetable mould. Various observations were made in regard to the religious emblems discovered, but beyond a strong resemblance of some of them to those of Eastern Asia, no extraordinary developments are made. Dr. Le Plongeon's accounts show a remarkable and interesting continuity of language, family names, and even of habits, between the ancient inhabitants of Yucatan and their modern descendants. It has been well said that all archæological discovery originates in the endeavor to investigate traditions, which survive after stone and brick have crumbled to dust; and it is very probable that further acquaintance with the friendly and civilized natives may furnish clews to discoveries of great importance.—*American Architect.*

How the Weather Indications are Determined.

At the Signal Service Bureau in Washington the weather indications are recorded at 5 A.M., 11 A.M., 4 P.M., and 11 P.M. daily. A reporter undertakes to tell how the work is done, and this is what he sees:

Take a seat in the indication room with me, and we will see how the weather is gotten up. It is now 4 o'clock, Washington time, and telegrams are pouring in from all parts of the United States, Canada, British America, West Indies, Nova Scotia, and falling into the lap of the sergeant in charge. The territory covered is from Olympia, in Victoria, on the northwest coast of British America, across to Sydney, above Newfoundland, thence down to Havana, across to San Diego, California, and thence back again. There's a girdle for Puck. At a certain hour of the day—3 o'clock Washington time—observations are taken at all the stations, and then they begin to come in, chasing each other over the wires pell-mell, like a crowd of unruly school boys. These dispatches are called off to six gentlemen, each of whom sits before a map, one noting the thermometer, another the barometer, a third the condition of the weather, and so on. These are transferred to one large map, and then Old Probabilities makes his appearance. He glances over all; sees where a storm was at 1 A.M., and notes where it was at 3 o'clock. He takes into consideration the wind currents, the humidity, and all the minor details which his experience and learning have taught him. Not a word is spoken in the room. Old Probs is in a deep study. In a moment he will speak to fifty millions of people, and a few more over in Canada. His stenographer appears, and the indications are dictated for New England, then the Middle States, the South, West, Mississippi Valley, then, perhaps, a storm bulletin twenty-four hours in advance to warn some special section of the country.

Among the innovations made by General Hazen is the furnishing to sections of the country special reports of floods, the condition of rivers, and their probable rise or fall within the twenty-four hours following at given points. Then again reports are made for the Southern States on the weather during cotton picking time, signals being displayed from the telegraph stations denoting clear or bad weather coming. It is in contemplation to furnish the agricultural sections with indications for harvest time, so that the farmers will know when to cut their grain and when to take it in. The idea was to have small cannon at telegraph stations, and if a storm should be discovered in the night, which promised great damage, to awaken the farmers so they might save what they could. But it has been found that most country telegraph offices close at such an early hour that this cannot be carried out.

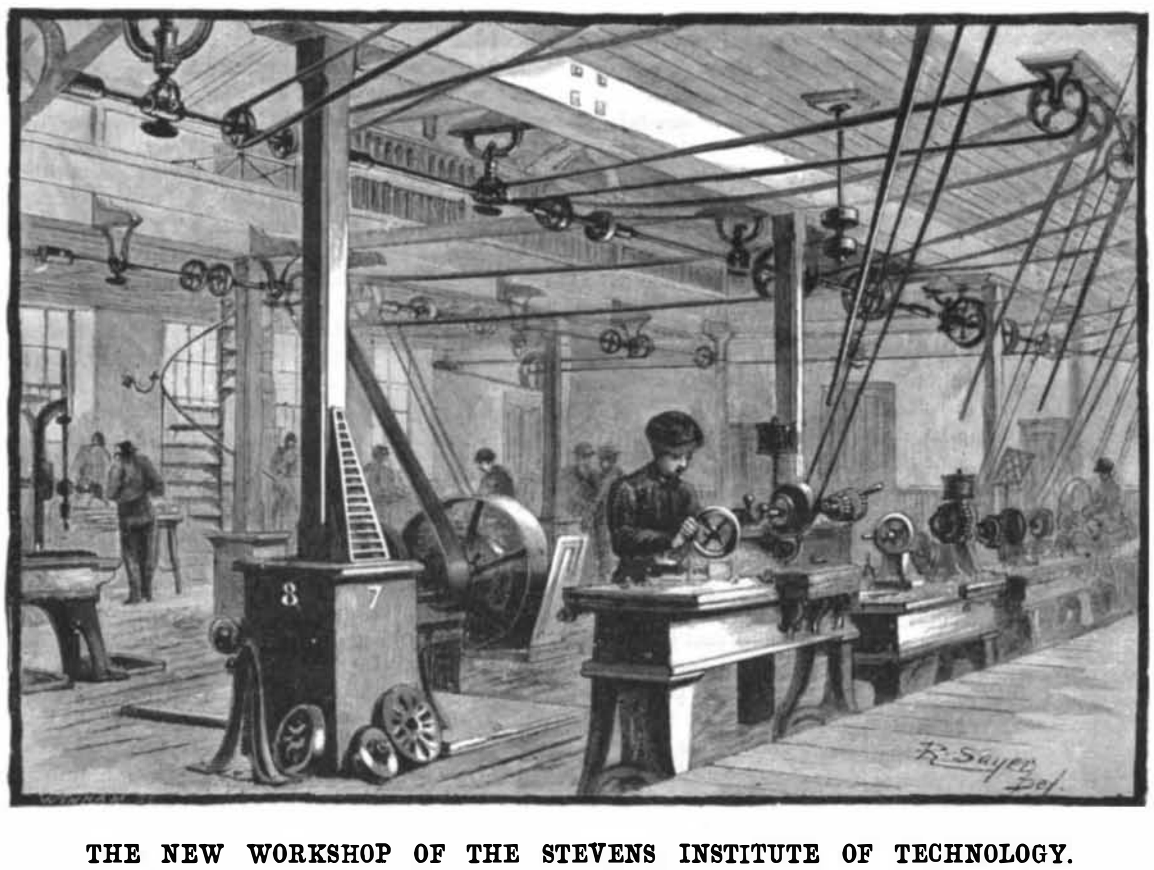
OPENING OF THE NEW WORKSHOP OF THE STEVENS INSTITUTE OF TECHNOLOGY.

This useful institution, as most of our readers know, is situated on the west bank of the Hudson River, in Hoboken, N. J., opposite Eighteenth street, New York, and one mile distant from our city limits. The unqualified success which for several years past has attended the efforts of the faculty in giving to the students, in connection with scientific study,

TOOL ROOM.—STEVENS INSTITUTE.

the opportunities for practical instruction in the mechanic arts, has rendered it desirable to enlarge and extend this branch of the establishment. The workshop has, therefore, been removed from the basement into the former lecture room of the institution, a building 50 by 80 feet, with high open roof and double galleries. This beautiful apartment has been generously fitted up by President Henry Morton, at his own cost, as a workshop for the students. He has filled it with the finest specimens of steam engines, lathes, planers, drills, milling machines, grinding wheels, and other mechanical appliances; all of which were formally presented by him to the trustees on the evening of May 14, and the occasion was one of much interest. The shop, brilliantly illuminated with the electric light and the machinery all in full operation, presented a very animated scene when the visitors entered.

The proceedings were opened by President Morton, who made a very admirable presentation address, in which he gave an outline of what the institution had done and aimed to do in the future for its pupils. Mr. Dod, of the trustees, accepted the gift of the President. Mr. Coleman Sellers, the eminent mechanician, followed with an excellent address, in which he paid a glowing tribute to the character of President Morton and spoke of the requisites for the education of the young mechanic. Mr. Horatio Allen and others also made addresses. The proceedings closed with a reception at the residence of the president. We give the addresses of the various speakers in our SUPPLEMENT. One of our engravings is an interior view of the new workshop. The other shows the tool room.



THE NEW WORKSHOP OF THE STEVENS INSTITUTE OF TECHNOLOGY.

The Pauperizing of English Labor.

The Macmillans have lately published a volume of thoughtful sermons by the Vicar of Granborough, England. In the introduction to the volume, the author insists upon the duty of the church to take a more active part in trying to ameliorate the condition of the English poor. He says: "I am the vicar of a rural parish in which more than 70 per cent of the population are potential paupers—that is to say, that out of some 70 families in the village, more than 50 are either actual or prospective recipients of the bounty of the poor law. I have not a single laboring man past work in my parish who is not either in the workhouse or in receipt of outdoor relief. When I lived among Sheffield workmen I used sometimes to come across people who asserted that they would rather starve than receive parish pay. I have never even heard of such a case in Buckinghamshire. I fear I have hardly a laborer in my parish who, if he were sick or out of work, would not welcome the visit of the relieving officer. Failing the 'wages of work,' the Bucks laborer learns to think of 'wages of the parish' as his of right. . . . We have fifty cottages, but have not one laborer's home with three bedrooms. We have seventeen with only one. Our death rate, which is generally so accurate an index of social condition, sounds satisfactory; it is only 18 per 1,000; but then one-third of our deaths are infants under the age of 1. I need not, however, multiply deplorable statistics of that kind."

How Japanese Fans are Made.

A British consul in Japan gives the following particulars touching the manufacture of folding fans at Osaka:

As in many other branches of industry, the principle of division of labor is carried out in the fan-making trade. The bamboo ribs are made in Osaka and Kioto by private individuals in their own houses, and combinations of the various notches cut in the lower part are left to one of the finishing workmen, who forms the various patterns of the handle according to plans prepared by the designer. In like manner the designer gives out to the engravers the patterns which his experience teaches him will be most likely to be salable during the ensuing season; and when the different blocks have been cut, it still rests with him to say what colors are to be used for the two sides of each fan. In fact, this official holds, if not the best paid, at any rate the most important, position on the staff in ordinary. When the printed sheets which are to form the two sides of the fans have been handed over to the workman, together with the sets of bamboo slips which are to form the ribs, his first business is to fold the two sheets of which the fan is to be composed, so that they will retain the crease, and this is done by putting them between two pieces of paper, well saturated with oil, and properly creased. The four are then folded together and placed under a heavy weight.

When sufficient time has elapsed the sheets are taken out and the moulds used again, the released sheets being packed up for at least twenty-four hours in their folds. The next process is to take the ribs, which are temporarily arranged in order on a wire, and "set" them into their places on one of the sheets, after it has been spread out on a block and pasted. A dish of paste then gives the woodwork adhesive powers and that part of the process, is finished by affixing the remaining sheet of paper. The fan has to be folded up and opened three or four times before the folds take the proper shape; and by the time the fan is put up to dry it has received far more handling than any foreign paper could stand; indeed, foreign paper has been tried, and had to be given up as unsuitable for the work; but with great care the Osaka fanmakers have been able to make some fans with printed pictures which have been sent over from America, though they were invariably obliged to use one face of Japanese paper The qualities of native paper now used are not nearly so good as those of which the old fans were made, and, in consequence, the style of manufacture has had to be changed. Instead of first pasting the two faces of the fan together and then running in pointed ribs, the ribs are square, and are pasted in their places in the manner described above. The outside lacquered pieces and the fancy work are all done in Osaka and Kioto, and some of the designs in lacquer on bone are really artistic; but the demand for the highly ornamented description of fans is not sufficient to encourage the production of large quantities of first-class work. When the insides are dry, the riveting of the pieces together, including the outer covering, is rapidly done, and a dash of varnish quickly finishes the fan.