pattern, was found in a fresh-water shell-heap on the bank of Watson's Creek, Mercer Co., N. J. The peculiar interest attaching to this "flame-shaped" specimen is, I consider, two-fold. First, the form is one hitherto known only as Mexican—at least, in the works on Stone Implements of which I have knowledge there is no illustration of a similar specimen; and secondly, while possibly this specimen may have been brought from Mexico, through the system of barter so extensively carried on by the aborigines—(I have found fragments of obsidian arrow-points in New Jersey, the material of which, if not the finished weapons, must have come from Mexico)—it seems more probable that it was fashioned in this neighbourhood, and being found, it may be, of an undesirable shape (Mr. Tylor does not state if this pattern was common or rare in Mexico), was not adopted as one of the many forms given to this class of weapons. If my supposition is correct, then the specimen is a good example of the production of a similar style of weapons in distant quarters of the globe.

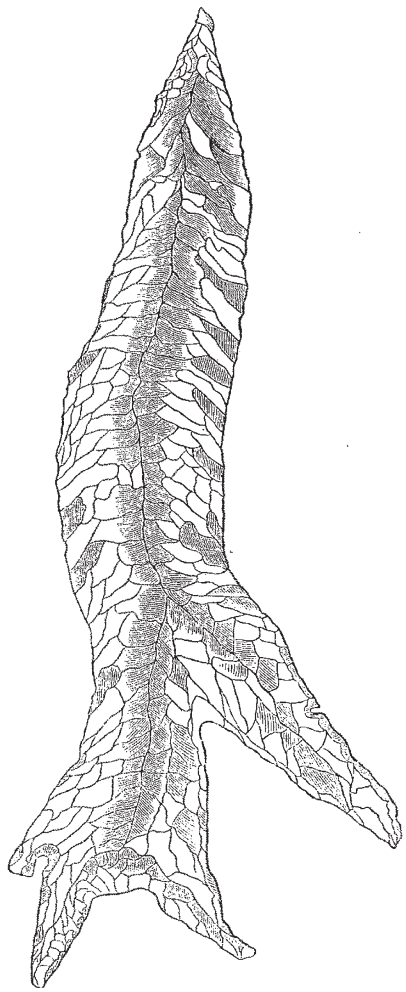

FIG. 2.—(Natural size.)

The mineral, both of this specimen and that which is represented by Fig. 2, is a dull bluish-white hornstone, very similar in general appearance to the European flint. The smaller specimen measures two and a quarter inches in length. It is noticeably thin, and remarkable for the small size and irregular outlines of the flakes. This irregular flaking off of the mineral under the blows of the hammer-stones is due to the "impure" character of the mineral, there being thread-like veins of brittle silex (?) enclosing minute pebbles extending through the mass in every direction, and these appear to have checked the flakes and caused their jagged irregular outlines.

Fig. 2 represents a remarkable javelin head made of the same material as the preceding, and having, but in a less degree, the "flame-shape" of the smaller specimen. The character of the workmanship indicates, I think, that the same aborigine chipped them both. Like the other, this spear-head is very thin and "irregularly" flaked. In the shell-heap in which these were found, as far as we have examined it, there was nothing else that differed from the ordinary "finds" and contents of aboriginal graves, being simply leaf-shaped arrow-heads, grooved stone axes, a corn-crusher and basin ("Querns," *vide* Evans' "Stone Implements of G. B.," p. 233), and a polished celt.

CHAS. C. ABBOTT

Trenton, New Jersey, U.S.

PROTECTION FOR INVENTIONS

WE stated in our leading article of the 24th ult. on this subject, that in the course of the discussion at the Society of Arts, Col. Strange had mentioned that the Patent Commissioners requested the Royal Society some time ago to nominate one of three eminent men of science who should perform the herculean task of infusing scientific order into the Patent Office, but without salary.

The Society of Arts, in their journal of the 25th ult., have very properly published correspondence which fully establishes the correctness of a statement which otherwise might well be thought incredible. The subject of niggardliness to scientific men is so important, not merely to the men themselves, but more still to the progress of knowledge, and therefore to the interests of the whole community, that we feel bound to republish this correspondence. We must, of course, regret to animadvert on the acts of the late Lord Romilly, who is no longer amongst us to justify them; but the public duty must still be performed, and as his lordship wrote as the spokesman of his colleagues, they can at any rate defend, if they can, what at present seems indefensible.

In Lord Romilly's letter the proposed duties of these unpaid men of science are enumerated: they are to "superintend the general management of the Patent Office, to see that the indexes and abstracts of the specifications are made accurate and complete, and to redress the other defects complained of."

We here see precisely what sort of work four highly salaried lawyers considered men as eminent in science as they in law might with perfect justice be expected to execute for nothing, namely, a combination of hard routine drudgery with the most delicate discrimination in questions extending over the whole range of scientific knowledge. It is true that their labours were to be lightened by the invaluable privilege of "acting in conjunction with the Lord Chancellor and the Master of the Rolls, and of referring to them" whenever the occasion of too tough a problem might require it. In plain English, the men of science were to do all the work of the Patent Office gratuitously, but in the name of these highly-paid lawyers, who notoriously do none of it, but who would thus pocket both the credit and the substantial reward.

If this had been an isolated example of the assessment of scientific work in England, we should hardly have cared to draw attention to it for the mere sake of denouncing exceptional narrowness of view and selfish injustice. It is because the example is typical that we assist Col. Strange and the Society of Arts in exposing it. The best proof of the prevalence of the same spirit is afforded us by some evidence volunteered by the Marquis of Salisbury before the Duke of Devonshire's Science Commission. His lordship observed that "Government departments have got an idea into their heads—I do not know why—that scientific opinions differ in this from medical

and legal opinions, that they have a right to have them gratuitously. I have never been able to understand on what grounds that theory rests; and my belief is, that if you would assimilate scientific knowledge to medical and legal knowledge in that respect, you could always get, for a proper remuneration, the very best scientific opinion that the country is able to furnish. You cannot expect that you should be able to make upon a man, every moment of whose time is occupied, a demand involving his time for hours or days of research, if you are not prepared to behave to him as you would to a lawyer in a similar case."

There is no reason to suppose that, though these observations reflect with severity upon the Patent Commissioners' proposal, Lord Salisbury had that case in view when he made them. He was no doubt giving the result of his wide experience as a statesman and departmental chief, and it is a comfort to know that in the present Cabinet there is at least one man competent to assign its true value to scientific work, and bold enough to insist that that value shall be given. It will be perceived that Lord Salisbury hints that the departments are not, and cannot be expected to be, supplied with "the best scientific opinion," because it is not properly paid for. He therefore urges liberality to men of science, as we have always done, strictly on the ground of public policy. An instance in point recently came to our knowledge where a department asked one of our most eminent physicists for an opinion on a meteorological question, but the correspondence was abruptly closed on his venturing to inquire what would be his remuneration for preparing a laborious and difficult report.

Foreign nations are now teaching us that it is time short-sighted parsimony like this came to an end, and that the sooner men in authority are "prepared," as the Patent Commissioners phrase it, to pay handsomely for the most fruitful work of which man is capable, the better for the country.

It must not be overlooked that at the time this preposterous proposal was made by the Patent Commissioners two of their own number were the recipients of 5,000*l.* or 6,000*l.* a year, paid out of the Patent fees, for which they rendered, and could render, for want of the requisite knowledge, absolutely no service to the Patent system, and that the surplus income of the office was about 90,000*l.* per annum.

The following is a copy of the correspondence referred to by Col. Strange in his remarks during the discussion, as having taken place on the subject of appointing unpaid Commissioners of Patents:—

(*Copy of the Memorial.*)

To the Right Hon. the Lord Romilly, Master of the Rolls.

My Lord,—The great use of patents is to make known the inventions, processes, and secrets of others. It is therefore highly important that the mass of information accumulated at the Patent Office should be made available, so as to make known as far as possible all inventions and modes of manufacture for the benefit of the country. The advantage of so doing would be immense, and would help to keep the manufactures of this country in advance of others. Action in this direction on the part of the authorities has been prayed for in every memorial that has been presented.

One of the first memorials was presented by the Institution of Mechanical Engineers, with Mr. Robert Stephenson as president at its head. This was presented in 1853 to the Right Honourable Frederick Lord Chelmsford, Lord High Chancellor of Great Britain, the Right Honourable Sir John Romilly, Master of the Rolls, Sir Fitzroy Kelly, her Majesty's Attorney-General, and Sir Hugh McCalmont Cairns, her Majesty's Solicitor-General; and prayed for greater facilities being given to persons making inquiries in any branch of knowledge at the Patent Office.

The second memorial in 1862 was presented to the Right Honourable Sir John Romilly. It prayed amongst other things for "a building as an office for patents, including in it a complete library, a commodious reading-room, and suitable offices for a proper staff of clerks and others to prepare well-digested and numerous abstracts and abridgments of inventions and processes, made public either by the specifications of patents or otherwise, and whether English or foreign."

A third memorial was presented to Sir John Romilly in 1864. It prayed not only that the efficiency of the office should be increased, but called the attention of the Commissioners to recent reductions in the staff and its disorganised state; which staff was "utterly inadequate to satisfy the requirements of persons seeking information among the very numerous works contained there." The memorialists went on to state that "they had entertained the hope that, so far from a reduction being made, there would have been an increase ordered to such an extent as would have enabled the abridgments of the specifications in the various branches of art (which abridgments were commenced about seven years ago) to be pushed vigorously forward, so as to complete the abstracting of the whole of the original specifications, and to keep up those abstracts from year to year as new matter is furnished. Your memorialists feel it is hardly possible to overrate the advantages to be derived by the public from a complete and intelligent system of abstracts; and they venture to urge upon the consideration of the Commissioners the necessity of at once providing a sufficient number of qualified persons (to be under the entire control of the scientific officer appointed by the Commissioners to superintend the specifications) to assist that officer in preparing such abstracts, and also to collect and epitomise scientific information generally."

The president and members of the Institution of Mechanical Engineers addressed a memorial in 1864 to the Right Honourable Lord Westbury, then Lord Chancellor, bringing under his lordship's notice the fact "that very great loss and delay are occasioned to manufacturers, inventors, and others, by the want of a complete classification and the prompt indexing of all inventions, whether patented or not, foreign as well as English. Such a systematic arrangement as is needed is quite within the compass of an efficient staff of officers possessed of technical knowledge, and could be at once proceeded with; the state of inventions could then be ascertained, and the common case of several persons patenting the same thing would be avoided."

In 1864 a Select Committee of the House of Commons inquired at great length into the working of the Patent Office; and reported, in accordance with the general tenor of the evidence, that much more was required to be done at the Patent Office to render it efficient; that more attendants were required, and "that the want of increased accommodation was so much felt as to prejudice the due administration of the Patent-law" (paragraphs 3 and 4 of report; answers 10 to 13, 18 to 21, 658 to 662, 667, 817, 863, 1038, and 1039 of evidence).

We merely allude to the opinions expressed by the Select Committee of the House of Commons, scientific men, manufacturers, engineers, and inventors, as the various memorials and other documents are in the possession of the Commissioners of Patents; but we would further mention that the various Commissioners of Patents have from the year 1858 reported from time to time to the Lords of the Treasury that great improvements were wanted, and a good building urgently required for the purposes of the Patent Office.

In conclusion we beg to state that it is our decided opinion, and that of many of those who have signed various memorials, that it would conduce greatly to the progress of manufactures and the advancement of commerce, if the large stock of knowledge of inventions and processes, both patented and open, stored at the Patent Office, were made available to the manufacturers and the public generally; and this your petitioners believe would best be compassed if her Majesty were graciously pleased to appoint that "other person as Commissioner of Patents," as contemplated by the Patent-law Amendment Act of 1852, and if the staff at the Patent Office were augmented by the addition of a sufficient number of persons, possessed of good technical knowledge, and well able to abstract all specifications as they came in daily, so that they might at once be entered into an efficient Subject-matter Index, which would give a true indication of what was in the specifications. In addition to this of course the large number of specifications already at the office would require to be abstracted and entered in a similar manner in a new edition of subject-matter indexes, that would really indicate what was contained in each specification, which the present indexes do not. Further, we beg to urge that similar subject-matter indexes be formed of all inventions and processes comprised in the very numerous indexes and tables of contents of the scientific books contained in the excellent scientific and technical library

of the Patent Office, so that any person using due diligence might easily learn with tolerable certainty whether an invention were new or old, which is not now the case.

We beg to append a sample page of such two subject-matter indexes as we would submit are urgently required. It is almost superfluous to mention that there are now several hundred thousands of pounds accumulated surplus, and an annual surplus of about sixty thousand pounds, contributed by the very class of persons who would benefit by such improved indexes.

L. L. DILLWYN, M.P.
RICHARD BAGGALLAY, M.P.
CHARLES FOX, Mem. Inst. C.E.
CHARLES HUTTON GREGORY, President Inst. C.E.
EDWARD WOODS, Mem. Inst. C.E.
C. WILLIAM SIEMENS, Mem. Inst. C.E., F.R.S.
ROBERT MALLET, Mem. Inst. C.E., F.R.S.
FREDERICK J. BRAMWELL, Mem. Inst. C.E. Council.
EDWARD A. COWPER, Mem. Inst. C.E.

20th March, 1868.

(*Copy of Reply of the Master of the Rolls to Mr. Dillwyn.*)

Rolls, 31st March, 1868.

Sir,—I transmitted to the Lord Chancellor the memorial presented to me on the 20th March instant by yourself and the gentlemen who accompanied you, relative to the present state of the Patent Office, together with my views on the subject; and we have since considered the matter in consultation together.

The result of this is that we are prepared to recommend to her Majesty's Government that three gentlemen should be appointed to act as Commissioners of Patents together with the Lord Chancellor and the Master of the Rolls for the time being—one to represent mechanical science, another to represent chemical science, and a third to represent the subjects more usually and more especially comprised in the term "Natural Philosophy." We should propose that the gentlemen to be recommended to her Majesty for this purpose should be, as regards the first, from gentlemen to be nominated by the Society of Mechanical Engineers; as regards the second, from gentlemen to be nominated by the Chemical Society; and as regards the third, from gentlemen to be nominated by the Council of the Royal Society. But we are not prepared to recommend that any salary should be attached to the services of these gentlemen. We trust and believe that gentlemen fully competent for the purpose may be found who have sufficient leisure, and who, from their love of science and their desire to disseminate more widely the discoveries made in these branches of science, would be willing to give their services without remuneration, and to superintend the general management of the Patent Office, to see that the indexes and abstracts of the specifications are made accurate and complete, and to redress the other defects complained of in your memorial, acting in all these respects in conjunction with the Lord Chancellor and the Master of the Rolls, to whom they would refer whenever the occasion might re quire it.

I think it, however, desirable to repeat that, on fully considering the subject, both the Lord Chancellor and myself have arrived at the same conclusion, that it would be inexpedient to create either one or more salaried officers for this purpose; and to say that we should both, if applied to, recommend her Majesty's Government not to accede to that part of the views of the gentlemen who composed the deputation, which had relation to the creation of paid officers. ROMILLY.

L. L. Dillwyn, Esq., M.P.

FRANCIS KIERNAN, F.R.S.

WE have to record the death, on Dec. 31st last, of Mr. Francis Kiernan, whose discoveries in connection with the structure of and circulation through the liver, published in the Philosophical Transactions of the Royal Society, and separately in a work entitled "Anatomical Researches on the Structure of the Liver," are so well known to all physiologists and histologists.

Mr. Kiernan was born in Ireland on October 2nd, 1800. His father was a member of the medical profession, who came to this country during his son's younger days. The son was educated at the Roman Catholic College at Ware, in Hertfordshire, and received his medical training at St. Bartholomew's Hospital, where, as a student, he gave signs of marked ability, devoting all his energies to the study of anatomy. In 1825 he obtained the membership of the College of Surgeons, and the Fellowship in 1843. In 1834 he was elected a Fellow of the Royal Society, subsequently receiving the Copley Medal.

Mr. Kiernan was amongst those most actively engaged in the establishment of the University of London, of the Senate of which institution, on its incorporation in 1837, he became a member, and subsequently a frequent examiner in his special subjects. He was never married. In 1865 he was seized with a paralytic stroke, from the effects of which he never fully recovered.

The investigations of Mr. Kiernan on the liver, together with those of Mr. Bowman on the kidney, will be always looked back to by biologists as the first-fruits of the introduction to natural science of the microscope in its modern form. Unlike many such productions, however, they have both fully stood the test of time.

THE RECENT THAW

THE thaw of January 1, 1875, happened almost simultaneously in Paris and London, and the phenomenon having been observed in both cities, it is possible to come to a definite conclusion concerning many similar occurrences.

The exact hour of the change in Paris may be stated to have been nine o'clock in the evening. If we suppose it was four o'clock in London, we see that five hours were a sufficient space of time for the gale to run the distance between both cities—about 300 miles.

Telegraphic warnings had been sent from London to the Paris Observatory, but were of little practical use, for want of proper means to disseminate the intelligence: otherwise, many inconveniences which were experienced by the Parisians, surprised by the falling of sleety snow, would have been avoided.

This remarkable occurrence may be referred to as affording strong evidence in favour of extending and popularising in both countries the use of weather telegrams. But I think it may be useful to try to draw from these circumstances some other conclusions.

In January 1871 I inquired of M. Buys Ballot, now the president of the Utrecht Meteorological Office, if he could tell me how to foresee if winds were likely to take a favourable course for ballooning from Lille to besieged Paris. I was told by the learned meteorologist to look at the upper clouds, as any real change must of necessity take place in the upper strata of the atmosphere, and descend gradually to the earth.

Unfortunately these upper clouds were for days and days running from the south, and the opportunity of trying an ascent was lost. Before the sudden thaw of the 24th of December, as well as before the 1st of January, I saw other clouds taking distinctly the same northern course. It seemed to me that the motion of the upper strata was communicated gradually to the air in closer proximity to the earth, and that the meteorological revolution of the 1st of January was preceded by a great change produced in higher regions through some unknown cause.

My conclusion seems to me to be supported by the fact that the air was obscured by vapours before the thaw actually took place. The sun lost apparently almost all his warming power, as the difference between *minima* and *maxima* read at the Observatory of Paris at the end of the cold periods amounted to a very few centesimal degrees—three or four only; clear air and hot sun being, if the theory is supported by facts, an evidence that cold weather is to last for a long period. It seems that the upper current is produced by cold and dry air coming from the north and pushed southwards.

It would be interesting to submit the theory to the test