the effect on man. One of themselves, accordingly, took, on one occasion, half a grain of iodide of methyl-morphium as a powder, and on another, one grain (containing about three-fourths of a grain of morphia), but on neither occasion was there observed the slightest soporific or other effect.

Four grains of sulphate of methyl-morphium produced decided narcotism on a rabbit, but no convulsive effect. Indeed, with this dose, and with various others that were given, paralysis appeared, and the authors have demonstrated that this symptom is due to an effect on the motor nerve end-organs.

Iodide of methyl-nicotium was obtained in the form of crystals extremely soluble in cold water. When given to rabbits by subcutaneous injection, a dose of five grains was perfectly inert; one of fifteen grains produced serious symptoms, followed by recovery: and a dose of twenty grains was fatal. The symptoms were principally distinguished from those of nicotia by the absence of convulsions; but no paralytic action on motor nerve end-organs was caused.

The authors have also investigated the action of iodide of methyl, and they obtained no evidence in support of the extremely improbable hypothesis, that some of the changes produced in the action of the substances they had examined might have been due to the addition of the physiological action of the methyl compounds. They conclude by discussing the possible causes of these modifications, by pointing out some of the practical applications of their results, and by promising to examine how far iodide of methyl may prove an antidote to the poisonous effects of these vegetable alkaloids, whose fatal dose it increases.

2. On the Burning Mirrors of Archimedes, and on the Concentration of Light produced by Reflectors. By John Scott, Esq. Communicated by Professor Kelland.

That the Roman ships were destroyed by burning glasses invented by Archimedes, is mentioned as a fact by most of the ancient writers, especially those who treat on mechanics, and their statements have been repeated by succeeding authors, without any

doubts having been suggested until comparatively recent times. The earliest authorities on the subject are Diodorus Siculus, Lucian, Galen, Dion Cassius, and Pappus. It is much to be regretted that a work by the last named author on the Siege of Syracuse is now lost; but Zonares and Tzetzes, writers of the 12th century, in whose time it was extant, give quotations from it. That of the latter, translated pretty literally, runs thus:—"When Marcellus had placed the ships a bow shot off, the old man (Archimedes) constructed a sort of hexagonal mirror. He placed at proper distances from the mirror other smaller mirrors of the same kind, which were moved by means of their hinges and certain plates of metal. He placed it amid the rays of the sun at noon, both in summer and winter. The rays being reflected by this, a frightful fiery kindling was excited on the ships, and it reduced them to ashes, from the distance of a bow shot. Thus the old man baffled Marcellus, by means of his inventions."

At a later period, mirrors similar to that of Archimedes, appear to have engaged the attention of Baron Napier of Merchiston, and other mathematicians; but strange enough, the famous naturalist, Buffon, was the first to establish the practicability, and therefore the probability, of the achievement. He employed a combination of plane reflectors, consisting of ordinary looking-glasses, eight inches by six, attached to a single frame. With forty of these glasses he set on fire tarred beech at a distance of 66 feet. A plank smeared with tar and brimstone, was ignited at 126 feet, by 98 glasses. A combination of 128 glasses, with a clear sun, inflamed very suddenly a plank of tarred fir at 150 feet. In addition to these experiments made at Paris, about the beginning of April, others were made in summer, by which wood was kindled at 200 and 210 feet, and silver and other metals were melted at distances varying from 25 to 40 feet.

So much for the positive side of the question, let us now briefly consider the negative side.

Descartes and others treated the whole affair of the burning mirrors as a fiction, on the gratuitous assumption that the specula employed were single parabolic reflectors. A different and more valid reason for doubt has arisen from the circumstance, that

Polybius, Livy, and Plutarch, are silent respecting the burning mirrors, although they describe some of the other contrivances employed by Archimedes against the assailants. In reply to this objection, it has been stated, as an admitted axiom in estimating historical evidence, that the silence of one author is not sufficient to disprove an event of which another, even subsequent in point of time, has given a plain and consistent narrative. Besides, similar omissions by ancient historians are not unfrequent; and in this instance, it is the less surprising, since the invention had perished with the fall of Syracuse, and the death of the illustrious inventor, who, in the peculiar circumstances, must have endeavoured to keep from his contemporaries the secret of its construction.

Returning to Buffon's experiments, Peyrard appends to his translation of the works of Archimedes a memoir of his own, pointing out the defects of Buffon's combination of reflectors, viz.:—That the number of assistants required to adjust so many mirrors were apt to confuse one another—the operation itself was a tedious one, taking about half an hour for one hundred and sixty-eight mirrors—and, after all, the superposition of the light was imperfect. Again, after a short interval, a readjustment would be rendered necessary by the angular deviation of the rays, arising from the varying position of the sun. Peyrard suggests "that each mirror should be furnished with a telescope, and a somewhat complex apparatus, to render the adjustment more speedy and accurate, and by this means to diminish the number of assistants required. This remedy is admitted to be only partial. It is proposed, in what follows, to obviate the forementioned defects, by producing a solar reflecting machine, capable of being directed by one eye, guided by a single hand, and coinciding in its construction with the description in the fragment preserved by Tzetzes from Pappus.

It is stated that Archimedes contrived a hexagonal mirror, and placed at proper distances from it other smaller ones of the same kind. This peculiarity has no parallel in that of Buffon. Articles 11, 12, and 13, in the memoir, show how burning mirrors can be constructed, corresponding to the above description, free from the defects of Buffon, and capable, moreover, of darting the consuming rays instantaneously in any given direction, thereby affording a

strong presumption that the accounts respecting the Archimedian Mirror are in the main authentic.

3. On the Great Pyramid of Gizeh, and Professor C. P. Smyth's Views concerning it. By A. D. Wackerbarth, A.M., of Upsala. Communicated by Professor Kelland.

The author gives a detailed statement of the theories of Professor Smyth, as given in the Transactions of this Society, Vol. XXIII. Part III. He then, after heartily commending the zeal and diligence of the Professor, brings forward objections to some of his views. 1. As to the metron or unit of linear measure. Mr Wackerbarth objects that this measure was utterly unknown to the ancient Egyptians—appearing in no Egyptian document or monument whatever, nor in any ancient writer who describes the condition of the Egyptians. Mr Wackerbarth collects from the materials most accessible the following table of weights and measures in use amongst the ancient Egyptians (corrected for the recent measure of the cubit of Karnak, made by Sir Henry James).

LONG MEASURE.										English Inches.
1.	π Η Ϟ (Digitus),									0·73925
2	1. Κόνδυλος,									1·4785
4	2	1. π ο π (Palmus),								2·957
5	2½	1¼	1. β η α τ Ϟ (Vola),							3·69625
6	3	1½	1½	1. Kubdeh,						4·4355
8	4	2	1⅔	1⅓	1. Διχάς,					5·914
11	5½	2¾	2½	1⅝	1⅜	1. Fitr,				8·13175
13	6½	3¼	2⅔	2½	1⅞	1⅔	1. ε ρ τ ω (Σπιθαμή),			9·61925
28	14	7	5⅔	4⅔	3½	2⅔	2⅓	1. α α Ϟ ι (cubit)	20·699	

ITINERARY MEASURE.									
1.	β ο ο Ϟ τ η (Εσάδιον),				606·875 ft. Eng., or 623 ft. Swedish.				
60	1. π ο Ϟ η ρ ω Ϟ (Σχοῖνος),				{ 6·9 English miles, or 1 Norwegian mile = ⅓ degree of equator.				
150	2½ 1. Δ ο Ϟ ρ .				{ 17·2 English miles, or 2½ Norweg. miles = ½ degree.				