of this class that the Society should draw its new members, I fear that the new policy will defeat its own object.

I take this opportunity of directing attention to the position in which the lack of organisation in the chemical world places the younger men, and in particular those who are entering industrial life. The young industrial chemist may be expected to belong to the following organisations, and to pay the corresponding subscriptions, in addition to entrance fees, which I have not set down :

The Chemical Society . . .	3*l.* 0 0
Institution of Chemical Engineers .	5*l.* 5 0
Institute of Chemistry . . .	2*l.* 0 0
Society of Chemical Industry . .	2*l.* 10 0
Faraday Society	2*l.* 0 0

The total amounts to an annual charge of nearly fifteen pounds, and in addition there will be the subscriptions to be paid to one or more specialised organisations.

Between them these societies do not possess a library which is in any way comparable with the Patent Office Library, or a lecture hall which will accommodate even a moderately well attended meeting; no set of *abstracts* comparable with "Chemical Abstracts" of the American Chemical Society is published in the country. These are hard things to say, but it is time that attention was directed to the facts.

A recent attempt of my own to recruit for one of our societies met with failure, as my intended victim pointed out that "he had the use of the Patent Office Library free, and generally preferred to attack his chemical literature through the publications of the American Chemical Society." Will any chemist suggest a suitable reply? I have not been able to think of one.

When reorganisation of the societies connected with chemistry is suggested, it is always stated that it is impossible to raise the money which will be required. I have had a good deal to do with the raising of money for such objects, and there is one thing I know in connexion with the matter. It is this. If you want to raise money you must show that you are spending what you have got economically. You must also show that you know what you want, and what you are going to do with the money when you get it. If, as is rumoured, schemes for reorganisation are under consideration, it is well that they should see the light of day in a form in which they can easily be understood, and as soon as possible.

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September 22.

Surface Tension and Fine Particles.

THE formation of colloidal particles is undoubtedly influenced greatly by the forces of surface tension, which will tend to cause the coalescence of fine crystals into small amorphous bundles probably spherical in shape. An elementary investigation into the forces at work shows that the activity due to surface tension effects, when one is dealing with very small particles, may be very much more pronounced than is the case with our usual observation of larger masses.

If we consider the case of two equal small spheres of matter brought together, for example, two small drops of water in air or two colloidal particles in a liquid, surface tension forces tend to make them coalesce into one body having the least possible area. The action is regulated by the law that the reduction in the potential energy of the surface is equal to $T \times \Delta A$, where T is the surface tension between the surface of the particles and the surrounding medium (supposed constant) and ΔA is the change in area due to coalescence. The total change in energy is then proportional to the square of the radius of the particles (r). This change of energy is the seat of the force pulling the particles together and deforming them into a new shape. As energy has the dimensions of FL, we have a quantity of dimensions (FL) varying as r^2, and consequently the force involved will vary as r. Now force induces in mass an acceleration, and consequently the acceleration (a) produced by the surface tension action is such that $a \propto F/m$. Since $F \propto r$, and $m \propto r^3$, the acceleration produced varies inversely as the square of the radius of the particles.

Although, of course, no definite acceleration can be determined in any particular case, the above shows that what we might call the "activity" of the effect of surface tension on small particles will vary inversely as the square of the radius of the particles and, for very small ultramicroscopic particles, the rapidity of this action will be far beyond anything that we are acquainted with in ordinary macroscopic observation.

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The "Hole, Slot and Plane" Geometrical Constraint.

A DETAIL in the "hole, slot and plane" geometrical constraint (which is one of the commonest forms of the "six point support" mentioned in Sir George Greenhill's letter in NATURE of September 27) seems often to be described and constructed wrongly. In this constraint, one contact occurs between a rounded projection on one body and an approximately "plane" part of the second body; two contacts occur between a rounded projection and the sides of a groove or "slot"; and the remaining *three* contacts should therefore be arranged to occur at the "hole."

The "hole" contact should not consist of a conical point resting in a conical hole of larger angle; for contact would not occur at three places, and the two cones cannot be made accurately right to their apices. If a conical projection be used, resting in the end of a simple circular cylindrical hole, contact would in general occur at two places. If the axes of the cone and cylinder were coincident (or if a sphere were used in place of the cone), line contact would theoretically occur, the actual places of contact depending in practice on the accuracy with which the surfaces were shaped. The *three* contacts at the "hole" could, however, be made by using a spherical or conical projection resting in the end of a hole of triangular transverse section (or resting on three spheres or three cylinders attached to the second body).

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September 17.

The Large Black Slug at Honolulu.

LAST month, when in the Mansa Valley, Honolulu, Hawaiian Islands, I became acquainted with the large slug which is now common in that locality. A living specimen was handed to me by Dr. Robert Faus, and later Dr. Montague Cooke gave me a good series from the collection of the Bishop Museum. Until recent years these slugs were unknown in the islands, and no