be adjusted upon ϵ of the same constellation, so as to make that perfectly round."

These remarks have an essential bearing upon the investigation of elements. The components must have been very close at both Herschel's epochs—if there be no mistake in the register—and this is not at first sight readily explained by the curve exhibiting the motion of the smaller star from Struve's earliest micrometrical measures in 1825 to the present date.

Herschel further remarked in 1802 that the appearance of the components was much like that of "a planet with a large satellite, or small companion," and strongly suggestive of "the idea of a connection between the two bodies, especially as they are much insulated."

THE ROTATION OF VENUS.—In a note upon the time of rotation and position of the axis of Venus, which recently appeared in this column, reference was inadvertently omitted to Flaugergues' observations at Viviers in July, 1796, which, according to a communication from Valz to the *Astronomische Nachrichten* (No. 278, vol. xi), seemed to favour Bianchini's period, and placed the north pole of Venus in longitude 321° 20′, with an elevation of 16° 28′. Details of the observations are wanting, but Valz states that Flaugergues observed with "une ancienne lunette à deux verres de 18 pieds de long, amplifiant 105 fois qu'il dit fort bonne." He also employed one of 14 feet, and a telescope said to be good, which Legentil brought from India. Valz adds: "J'ai vu le dessein original de la tache, elle etait grande et de forme trapezoide arrondie, &c."

Hussey's vigorous but prejudiced defence of the extraordinary period of rotation assigned by Bianchini will be found in *Astronomische Nachrichten*, No 248.

Fritsch, of Quedlinburg, thought some observations of his in April 1801 indicated a period of 23h. 22m. (*Berliner Astronomisches Jahrbuch*, 1804, p. 213).

SONG OF THE SCREW

A MOVING form or rigid mass,
  Under whate'er conditions,
Along successive screws must pass
  Between each two positions.
It *turns around* and *slides along*—
This is the burden of my song.

The *pitch of screw*, if multiplied
  By angle of rotation,
Will give the distance it must glide
  In motion of translation.
Infinite pitch means pure translation,
And zero pitch means pure rotation.

Two motions on two given screws,
  With amplitudes at pleasure,
Into a third screw-motion fuse;
  Whose amplitude we measure
By parallelogram construction
(A very obvious deduction).

Its axis cuts the nodal line
  Which to both screws is normal,
And generates a form divine,
  Whose name, in language formal,
Is "surface-ruled of third degree."
Cylindroid is the name for me.

Rotation round a given line
  Is like a *force* along.
If to say *couple* you incline,
  You're clearly in the wrong;—
'Tis obvious, upon reflection,
A line is not a mere direction.

So *couples* with *translations* too
  In all respects agree;
And thus there centres in the screw
  A wondrous harmony
Of Kinematics and of Statics,—
The sweetest thing in mathematics.

The forces on one given screw,
  With motion on a second,
In general some work will do,
  Whose magnitude is reckoned
By angle, force, and what we call
The *coefficient virtual*.

Rotation now to force convert,
  And force into rotation;
Unchanged the work, we can assert,
  In spite of transformation.
And if two screws no work can claim,
Reciprocal will be their name.

Five numbers will a screw define,
  A screwing motion, six;
For four will give the axial line,
  One more the pitch will fix;
And hence we always can contrive
One screw reciprocal to five.

Screws—two, three, four, or five, combined
  (No question here of sex),
Yield other screws which are confined
  Within one *screw complex*.
Thus we obtain the clearest notion
Of *freedom* and *constraint* of motion.

In complex III. three several screws
  At every point you find,
Or if you one direction choose,
  One screw is to your mind;
And complexes of order III.
Their own reciprocals may be.

In IV., wherever you arrive,
  You find of screws a cone.
On every line in complex V.
  There is precisely one;
At each point of this complex rich,
A plane of screws have given pitch.

But time would fail me to discourse
  Of Order and Degree,
Of Impulse, Energy, and Force,
  And Reciprocity.
All these and more, for motions small,
Have been discussed by Dr. Ball.

ON THE TELEPHONE, AN INSTRUMENT FOR TRANSMITTING MUSICAL NOTES BY MEANS OF ELECTRICITY

MR. ELISHA GRAY recently read a paper before an American Society explaining his apparatus for transmitting musical notes by electricity. He showed experimentally how, by means of a current of electricity in a single wire, a number of notes could be reproduced simultaneously at a great distance, and how by this means also a number of telegraphic messages could be transmitted at once along a wire and separately received at the other end. One of Mr. Gray's apparatuses was exhibited in London at the last *soirée* of the Society of Telegraph Engineers by the president, Mr. Latimer Clark. The principle of the apparatus is as follows:—

A vibrating reed is caused to interrupt the electric current entering the wire a certain number of times per second and the current so interrupted at the sending end sets a similar reed vibrating at the distant end.

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